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Grounding, Causation and the Unity of Ontological Structure

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**GROUNDING, CAUSATION AND THE UNITY OF ONTOLOGICAL
STRUCTURE**

by

THOMAS KIVATINOS

A dissertation submitted to the Graduate Faculty in Philosophy in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

2017

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Thomas Kivatinos

This manuscript has been read and accepted for the Graduate Faculty in Philosophy
in satisfaction of the dissertation requirement for the degree of Doctor of
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Abstract

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by

Thomas Kivatinos

Advisor: Graham Priest

Unity is enchanting. That is, it is an enchanting idea that although reality seems to be fragmented in various ways, this apparent fragmentation belies a fundamental *unity*. This dissertation is an attempt at theoretically capturing such unity via the theoretical unification of causation and grounding. And this unification supports another: the unification of reality's causal structure and reality's hierarchical structure.

To propose a unification of causation and grounding, I employ a common conception of grounding on which grounding is understood as a dependence relation. On this conception, if the *Xs ground* the *Ys*, then the existence of the *Ys* depends upon the existence of the *Xs*. Thus, grounded entities *ontologically depend* upon their grounds. According to the standard view on the matter, this kind of dependence is distinct from causal dependence, and thus grounding and causation are distinct dependence relations. So, on this view, dependence comes in distinct kinds: causal and ontological. Dependence thus contrasts with a relation like identity, for example, which does *not* admit of variegated kinds: identity, unlike dependence, is *uniform* in all instances, since identity does not admit of distinct kinds. The standard view thus suggests that dependence is disunified. For this view suggests that there is a robust non-uniformity between instances of dependence: a non-uniformity between the instances of dependence that are considered cases of causation and the instances of dependence that are considered cases of grounding.

In critical response, I explore a revisionary view on which the distinction between causation and grounding is a *false* distinction. On “*grounding-causation-identity*” or “*GCI*” for short, causation and grounding are numerically identical relations: what it is for causation to hold is no different than what it is for grounding to hold. For dependence does *not* admit of distinct kinds, such as causal dependence and ontological dependence: just as the nature of identity does not vary across instances, for identity does not admit of distinct kinds, the nature of dependence does not vary across instances, for it also does not admit of distinct kinds. *GCI* thus suggests, against the standard view, that dependence is fundamentally unified. For the nature of dependence is uniform in all instances.

Further, as mentioned above, this unification of causation and grounding supports a unification of causal structure and hierarchical structure. That is, the unity of ontological structure is a ramification of the unity of dependence. This is because, as it’s commonly thought, ontological structure is “built” from dependence relations: on the one hand, reality’s causal structure is built from causal relations, and on the other, reality’s *hierarchical* structure is built from grounding relations. Since ontological structure is built from dependence relations, the distinction between causal structure and hierarchical structure hinges on the distinction between causal dependence and ontological dependence. Thus, because the standard view holds that causal dependence is distinct from ontological dependence, this view implies that reality’s causal structure is distinct from reality’s hierarchal structure. And so this view implies that ontological structure is fundamentally disunified. In contrast, since *GCI* denies the distinction between causal dependence and ontological dependence, *GCI* thus implies that the distinction between causal structure and hierarchical structure is also a false distinction: just as dependence is of one basic nature that does not vary, ontological structure is of one basic nature that does not vary. In this sense, *GCI* implies that on ontological structure is fundamentally unified.

The discussion throughout the dissertation consists in a multi-stage comparative analysis in which *GCI* is compared with the standard view as well as other alternative views: views which either portray the connection between causation and grounding differently than *GCI* or deny that there is any such connection. Though *GCP*'s rival views disagree about how or if causation and grounding are connected, these rival views are in agreement that causation and grounding are numerically distinct. In this respect, these rival views are each a specific variety of what I call “*grounding-causation-non-identity*” or “*GCN*” for short: the basic view that the relations are numerically non-identical.

The standard view on the matter, discussed above, I call “common-genus-*GCN*.” For on this view, although the relations are numerically distinct, they are tightly connected in the respect that they are species of a common genus: the genus of dependence. On another variety of *GCN*, although the relations are numerically distinct, they are tightly connected in the respect that one of these relations is a species of the other: either grounding is a species of causation or causation is a species of grounding. So, one of the relations *subsumes* the other in the way that a genus subsumes its species. Hence, I call this view “subsumption-*GCN*.” Lastly, on “strict-*GCN*,” the relations are numerically distinct, and there is no tight ontological connection between them: causation and grounding form a *gerrymandered* pair of relations, not a pair which is genuinely integrated.

Thus, listing the views to be discussed, the discussion consists in a comparative analysis of:

- *GCI*: The view that there is no ontological distinction between causation and grounding, thus they are numerically identical.
- Common-genus-*GCN*: The view that causation and grounding are numerically distinct, but they are tightly connected in the respect that they are species of the same genus.

- Subsumption-*GCN*: The view that causation and grounding are numerically distinct, but they are tightly connected in the respect that one of these relations is a species of the other.
- Strict-*GCN*: The view that causation and grounding are numerically distinct relations, and there is no tight ontological connection between them.

I compare these views by appeal to five main points of comparison. Thus, I present five central arguments in the discussion. And for each of these arguments, I defend a claim concerning which view is most plausible, or which views are more plausible, with respect to one of these points of comparison. These points of comparison are:

- How well the views explain the likeness between causation and grounding.
- How conceptually parsimonious the views are.
- How well suited the views are to the connection between causal explanation and metaphysical explanation.
- The ability of the views to provide an account of an anomalous dependence relation which crosses both time and ontological levels.
- The extent to which the views are supported or undermined by disputes about the purported differences between causation and grounding.

The goal of the discussion is to establish that *GCI* is *at least as plausible* as the best rival view or views, and so *GCI* is to be taken just as seriously. Thus the discussion presents considerations which favor *GCI* over rival views, considerations which favor *GCI* and rival views equally, and considerations which threaten *GCI*. And as I propose, these considerations balance out in such a way that *GCI* is just as serious of a view as the alternatives.

The dissertation is arranged as follows. Chapter 1 provides the background of the discussion via an outline of grounding and a host of related issues. Further, chapter 1 motivates the discussion by explaining the similarities between causation and grounding. As it is explained, since the relations bear such remarkable and systematic similarities, it is worth asking *why* they bear these similarities. For it would seem reasonable to think that the relations are connected in some way which *explains* these similarities.

In chapter 2, the first four central arguments are discussed. The “argument from likeness” (quite obviously) focuses upon the first point of comparison: how well the views explain the likeness between causation and grounding. I draw two conclusions from this point of comparison. Firstly, I conclude that strict-*GCN* is the least plausible view in question. As this argument goes, it speaks in favor of a view if the view can explain the similarities between the relations and it speaks against a view if it cannot. Thus, because strict-*GCN* is the only view of the four which cannot explain the similarities, it is the least plausible. Because of this, strict-*GCN* is left out the discussion from this point on. Concerning the second conclusion which I draw from the first point of comparison, I argue as follows. *GCI*, common-genus-*GCN* and subsumption-*GCN* offer equally plausible explanations of the similarities between causation and grounding. Therefore, these views are equally plausible with respect to this point of comparison.

Chapter 2 then presents the “argument from parsimony,” which (quite obviously) focuses upon the second point of comparison: how conceptually parsimonious the views are, where a theory’s *conceptual parsimony*, or lack thereof, is a matter of how many primitive notions it employs. As before, I draw two conclusions from this point of comparison. Firstly, I argue that because common-genus-*GCN* is less conceptually parsimonious than *GCI* and subsumption-*GCN*, common-genus-*GCN* is the least plausible with respect to this point of comparison. Secondly, I

argue that this point of comparison favors *GCI* and subsumption-*GCN* *equally*: since neither of these views employ fewer primitive notions than the other, they are conceptually parsimonious to the same extent.

Chapter 2 then present the “argument from explanation” which focuses on the third point of comparison: how well suited the views are to the connection between causal explanation and metaphysical explanation. As it is commonly thought, causation corresponds to causal explanation and grounding correspond to metaphysical explanation. As I suggest, if the distinction between causal explanation and metaphysical explanation holds, or if it clear what this distinction amounts to, this speaks in favor of *GCN* and against *GCI*. For *GCN* is better suited to the distinction between these kinds of explanation. This is because if one adopts *GCN* (in any variety), then one can treat the distinction between causal and metaphysical explanation such that it *reflects* the distinction between causation and grounding. And in this case, if one adopts *GCI*, then one must treat causal explanation and metaphysical explanation such that they fail to reflect the identity of causation and grounding.

Conversely, if the distinction between causal explanation and metaphysical explanation does not hold, or if it is not clear what this distinction amounts to, this speaks in favor of *GCI* and against *GCN* (in all varieties). For *GCI* is better suited to the lack of distinction between these kinds of explanation, or it not being clear what this distinction amounts to. This is because if one adopts *GCI*, then one can treat the lack of distinction between causal and metaphysical explanation such that it *reflects* the identity between causation and grounding. And in this case, if one adopts *GCN*, then one must treat causal explanation and metaphysical explanation such that they fail to reflect the non-identity between causation and grounding. As I argue, it is not clear what the distinction between causal explanation and metaphysical explanation amounts to, and so the distinction can be

plausibly denied. Thus, *GCI* is better suited to the connection between causal explanation and metaphysical explanation, and so this point of comparison favors *GCI* over *GCN*.

Lastly, chapter 2 presents the “argument from double-crossers,” which focuses upon the fourth point of comparison: the ability of the views to provide an account of an anomalous dependence relation which crosses both time and ontological levels. I call such dependence relations “double-crossover” relations. Because double-crossers cross both time and ontological levels, they qualify as both causal relations and grounding relations. As I argue, because double-crossers have this dual status, they pose a serious challenge to all varieties of *GCN*. For all varieties of *GCN* rely on the idea that one of the features which individuates grounding is the ordering that grounding imposes. And this means that all varieties of *GCN* require that causal relations cannot impose the kind of ordering which is characteristic of grounding. However, because double-crossers qualify as causal relation *and* grounding relations, double-crossers are causal, though they impose the ordering that is characteristic of grounding. So all varieties of *GCN* fail to provide a tenable account of double-crossers. In contrast, double-crossers pose no problem for *GCI*. Since *GCI* denies the distinction between causation and grounding, *GCI* denies that there is any feature of grounding which causal relations cannot have (in fact, *GCI* relies on the idea that causal relations can possess any feature of grounding, and vice versa). Thus, with respect to this point of comparison, I conclude that *GCI* is the most plausible view in question.

Chapters 3 and 4 both discuss the fifth point of comparison: the extent to which the views are supported or undermined by disputes about the purported differences between causation and grounding. Considerations about these purported differences are crucial to the discussion. For if one thinks that the relations do indeed bear differences, then one must affirm that the distinction between causation and grounding holds. And if one affirms that the distinction holds, then one must

reject *GCI*. For *GCI* relies on denying that the distinction holds. Conversely, if all the purported differences between the relations can be denied or called into substantial doubt, then the distinction between the relations can be plausibly denied. And therefore, *GCI* need not be rejected. Thus, the goal of the “argument from instability”—the argument which concerns the fourth point of comparison—is exactly that: showing that all the purported differences between causation and grounding can be denied or called into substantial doubt. In my terminology, because all the purported differences between the relations are argumentatively “*unstable*,” the distinction between the relations is argumentatively unstable. For if all the differences between the relations can be rejected or doubted, then there is no argumentatively stable foundation for affirming that the distinction holds.

Since there is a wide variety of purported differences between the relations, and since many of the disputes about these differences are quite complex, the discussion of these differences spans two chapters: chapters 3 and 4. And so, the argument from instability spans chapters 3 and 4. The first part of the argument, discussed in chapter 3, addresses a cluster of argumentatively-*integrated* differences between causation and grounding. These differences are argumentatively-integrated in the sense that, if it’s reasonable to think that one of the differences in the cluster does *not* hold, this provides support for thinking that some of the *other* differences in the cluster do not hold. Thus my criticisms of these differences intertwine. The second part of the argument from instability, discussed in chapter 4, addresses argumentatively-*unintegrated* differences between the relations: differences which require their own independent criticisms.

In chapter 5, I offer a general conclusion of the discussion. The discussion shows that there is a huge variety of issues to take into account, and many of these issues are quite complex and controversial. As I suggest, these considerations balance out in such a way that *GCI* is no less

plausible than the alternative views (i.e. common-genus-*GCN* and subsumption-*GCN*). Thus, *GCI* is to be taken just as seriously. I then close the discussion by elaborating some interesting ramifications of *GCI*.

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1

Groundwork for Unification

1.1. Preliminary Points concerning the Predicational Treatment of Grounding

To provide some orientation it will be helpful to make some preliminary points about a core issue on which accounts of grounding are divided. This is the issue of how grounding is to be regimented. On what is sometimes called the “predicational” approach, grounding is regimented as a relational predicate, e.g. “is grounded by,” which is flanked by singular terms that stand for entities, and thus grounding is treated as a relation.¹ The contrasting approach will be addressed in section 1.5. For the time being, the predicational approach will be the focus of attention.

Some accounts of grounding which assume the predicational approach differ with respect to what they consider to serve as the relata of grounding. A common version of the predicational approach restricts grounding’s relata to facts.² In contrast, another kind of account which also assumes the predicational approach makes no restriction on grounding’s relata and thus this kind of account is neutral with respect to the ontological category from which grounding takes its relata. On this latter sort of account, which I’ll call a “predicational-neutral” account, grounding can relate entities from any ontological category whatsoever and the categories need not be the same.³

¹ See Rodriguez-Pereyra (2005) or Schaffer (2009, 2015).

² See Audi (2012b), Raven (2012) or Rosen (2010).

³ See Cameron (2008) or Schaffer (2009, 2015).

To simplify matters, I will frame all discussion of the predicational approach to grounding solely in terms of the *predicational-neutral* version. However, it should be noted that the entire discussion below extends to *both* versions of the predicational approach. This is because discourse about grounding that is framed in terms of the predicational-neutral account can be re-framed in terms of the predicational account which restricts grounding's relata to facts. More specifically, for any given claim *C* about a grounding relation *R* such that *R* holds between relata *other than facts*, *C* can be re-framed as a claim about *R* such that *R* holds *between facts*.⁴ Thus, all of the claims and arguments to be discussed below are neutral with respect to whichever version of the predicational approach one assumes. And so, the view to be defended below is a view that extends to both versions of the predicational approach.⁵ Since attention will be restricted below to the predicational-neutral account, the phrase "predicational" will be used below to mean just "predicational-neutral." With these preliminary points now established, I turn attention toward a central theme of this chapter: the different ways that grounding can be treated by assuming the predicational approach.

1.2. Four Predicational Treatments of Grounding

⁴ For instance, if it is said that "an entity *X*'s existence grounds another entity *Y*'s existence," this can be re-phrased as "the fact that *X* exists grounds the fact that *Y* exists." Or, if it is said that "*Y* bearing some property *P* is grounded by *X* bearing some property *P*," this can be re-phrased as "the fact that *Y* bears *P* is grounded by the fact that *X* bears *P*."

⁵ One might object as follows. Indeed, it's correct that any given claim *C* about a grounding relation *R*, such that *R* holds between relata *other than facts*, *C* can be re-phrased as a claim about *R* such that *R* holds *between facts*. However, this is a mere matter of how claims about grounding are *phrased*; nothing more. Just because claims about grounding can be re-phrased in this way does not mean that a dialectic about grounding which is phrased in a predicational-neutral manner would play out conceptually the very same way as if one assumed the contrary kind of predicational account (which restricts grounding's relata to facts). In response to this objection, I must simply leave the issue aside. For this matter is one that extends beyond the philosophical concerns that are intended to be addressed here. An alternative way to set up this restriction of attention to the predicational-neutral account is to stipulate that this is the specific kind of predicational account that I seek to explore issues about: the alternative kind of predicational account is simply outside the intended scope of inquiry.

Even among the philosophers who commonly assume the predicational approach and thus understand grounding to be a relation, there are differences between them in how they frame this relation. So, even focusing on just the predicational approach, there is a variety of ways to treat grounding. For even assuming that grounding is a relation, grounding is spoken of in many ways, as we might put it. In this section, I will outline four treatments of grounding which commonly assume the predicational approach: “predicational treatments,” as I will call them. Since I will later reject the approach that serves as the alternative to the predicational approach, I will frame the discussion in the following chapters in terms of the predicational approach only. Hence the predicational treatments of grounding outlined here will serve as the background for the chapters to follow.

It is very common that predicational treatments frame grounding by appeal to one or some (or sometimes even all) of the notions of *ontological structure*, *fundamentality*, *ontological priority* or *ontological dependence*. In this section I will explain how grounding is treated in terms of each of these notions. In the next section, I will explain how the treatment which is focused upon ontological dependence can be used to capture the other predicational treatments. This will elaborate why, in later chapters, I will rely most heavily upon this specific predicational treatment and why doing so will not result in disregarding what these other treatments capture about grounding.

Let’s begin by discussing how grounding is sometimes presented in terms of the sort of ontological structure that is thought to be *hierarchical*: what I will call “*hierarchical structure*.” Thus, I call attention to the broad, commonly-assumed idea that reality is *layered* or *levelled*. As Kim (1993, 337) expresses this idea: “The Cartesian model of a *bifurcated* world has been replaced by that of a *layered* world, a hierarchically stratified structure of ‘levels’ or ‘orders’ of entities and their characteristic properties.”

Similarly, as deRosset (2013) expresses this idea:

Reality comes in layers. We often disagree about what there is at the bottom, or even if there is a bottom. But we agree that higher up we find facts involving a diverse array of entities, including chemical, biological, geological, psychological, sociological, and economic entities; molecules, human beings, diamonds, mental states, cities, and interest rates all occupy higher layers. The nature and existence of the entities in the higher layers are determined by, dependent upon, and derived from the more fundamental facts and entities we find lower down. So, it seems, there is a layered structure of facts and the entities those facts involve.
(1)

On what I will call “*the hierarchy-based treatment*” of grounding, grounding is presented as the relation which reality’s layered or hierarchical structure is built from. Or said differently, it is the relation from which the so-called “levels of reality” are built. The idea is thus that some entities ontologically undergird others at a deeper level of reality, and grounding is the relation by which undergirding entity connect to the entities at higher levels which they undergird: if X grounds Y , then X ontologically undergirds Y at a deeper level of reality’s hierarchical structure. As we might say then, hierarchical structure is built from grounding relations analogously to how casual structure is built from causal relations (more to be said about this below).

To identify some expressions of the hierarchy-based treatment of grounding in the relevant literature, Correia (2013) describes the theoretical task of “determin[ing] what grounds what” as the task of “unveil[ing] the layered structure of reality” (272). Likewise, to express the idea that grounding is what imposes hierarchical structure, Audi (2012a) suggests one can understand grounding such that “[g]rounding is the relation... doing the work in this hierarchical structure” (188). And Rabin and Raben (2016) identify “the world’s grounding structure” with the structure by which “the world [is] organized into a hierarchy” (349).

Turning attention to how grounding is presented in terms of *fundamentality*, grounding is often associated with the ontological ordering that is imposed by what is fundamental to what. On the conception in which the world is ordered this way, some entities do not exist side by side with

other entities ontologically speaking: because some entities are *derivative* of other entities, there is a sense in which some entities ontologically *undergird* other entities (echoing comments above and hinting at the idea that these treatments capture the same understanding grounding). The idea is that, if the Ys derive from the Xs, the Xs serve as an ontological derivation base for the Ys. To illustrate, it's a common thought that atoms are fundamental to molecules, or that brain states are fundamental to mental states, or that set members are fundamental to sets, or that word meaning is fundamental to sentence meaning. Thus, such examples present the idea that there is a relation of ontological *derivation* between entities. That is, each example presents the idea that there is an asymmetrical relation between entities such that some entities ontologically derive from others:

- Atoms are fundamental to molecules in the sense that molecules are derivative of atoms whereas the converse does not hold (atoms are not derivative of molecules).
- Brain states are fundamental to mental states in the sense that mental states are derivative of brain states whereas the converse does not hold (brain states are not derivative of mental states).
- Set members are fundamental to sets in the sense that sets are derivative of set members whereas the converse does not hold (set members are not derivative of sets).
- Word meanings are fundamental to sentence meanings in the sense that sentence meanings are derivative of words meanings whereas the converse does not hold (word meanings are not derivative of sentence meanings).

This suggests a conception on which entities are ordered in terms of what is derivative of what and thus in terms of what is fundamental to what—the sort of ordering I will call below a “*fundamentality ordering*” or an “*ordering of fundamentality*.” Generalizing this conception suggests a worldview on which all of reality’s contents assume a place within an ordering of what is fundamental to what. Relying on

this background, grounding is often framed as the relation which connects derivative entities to that from which they derive. Thus, grounding is understood as the relation which imposes a fundamentality ordering upon entities, and thus as the relation by which entities are fundamental to others. Or more simply put, on the “*fundamentality-based treatment*” of grounding, grounding is the *is-fundamental-to* relation: if *X* grounds *Y*, then *X* is fundamental to *Y*.⁶

To further elucidate the fundamentality-based treatment, what should be elaborated is that fundamentality is understood in different ways: fundamentality is understood in an *absolute* sense and a *non-absolute / relative* sense. Accordingly, there are varying characterizations of grounding that correspond to each sense of fundamentality. Roughly, for some *Xs* to be *absolutely* fundamental is for the *Xs* to be what is fundamental to all else and to which nothing is fundamental. The *Xs* would thus be the minimal elements of reality’s comprehensive fundamentality ordering. Or said differently, the *Xs* would occupy the first node of reality’s fundamentality ordering (assuming for the moment that there is such a node). To illustrate, if it’s true that quarks and leptons are what are fundamental to all else and to which nothing is fundamental, then quarks and leptons are absolutely fundamental. Framed specifically in terms of *absolute* fundamentality, grounding can be understood as follows: if the *Xs* are absolutely fundamental, then grounding is thought to be the relation by which all else derives from the *Xs* and the relation which the *Xs* bear to nothing else (in the sense that the *Xs* do not derive from anything). Accordingly, the *Xs* would be that which ground all else and that which is ungrounded.

In contrast, *non-absolute / relative* fundamentality is not framed in terms of the first node of reality’s comprehensive fundamentality ordering. For some *Xs* to be non-absolutely fundamental, i.e. relatively fundamental, is for the *Xs* to be fundamental *relative* to entities which are located at a

⁶ For examples of this treatment of grounding see Cameron (2008), Schaffer (2009, 2015) or Raven (2012).

higher node of reality's fundamentality order and which derive from the Xs. To illustrate, there is a sense in which molecules can be considered fundamental in some way despite the fact that molecules are not *absolutely* fundamental, such as follows. Because molecules are fundamental to cells for instance, because cells derive from molecules, molecules can be considered fundamental in a *relative* sense: a sense in which molecules are fundamental relative to such entities as cells which occupy a higher node or reality's fundamentality ordering and which derive from molecules. Thus, molecules can be characterized as fundamental in the sense that that they are *fundamental relative to* cells or said differently, they are *more fundamental than* cells.

Framed in terms of *relative* fundamentality, grounding can be understood as the relation by which some entities are fundamental *relative* to others. Or more specifically, grounding is the relation by which some entities, the Xs, located at any given node of reality's fundamentality ordering (and thus not necessarily the first node) are connected to entities which are located at a higher nodes above the Xs and which derive from the Xs. So, the fundamentality-based treatment of grounding allows for grounding to be understood not merely as the *is-fundamental-to* relation, but either as the *is-absolutely-fundamental-to* relation and/or the *is-relatively-fundamental-to* relation.⁷

To now turn attention away from the fundamentality-based treatment, grounding is often associated with *ontological priority*. The third predicational treatment of grounding to be discussed, to which I now turn, is based on that association. Quite similarly to how the fundamentality-based treatment of grounding treats grounding as the *is-fundamental-to* relation, the "*priority-based treatment*" of grounding presents grounding as the *is-ontologically-prior-to* relation. Said differently, on this

⁷ There are additional senses of fundamentality which I leave aside since the discussion does not hinge upon them.

treatment, grounding is the relation by which some entities are ontologically prior to others: if X grounds Y , then X is ontologically prior to Y .

To identify some expressions of this treatment in the relevant literature, in Schaffer (2009)'s influential discussion of grounding, Schaffer elucidates what grounding is by citing various historical examples of ontological priority (or “priority in nature”). In doing so, he illustrates the priority-based treatment of grounding when discussing Aristotle’s use of the notion of ontological priority. As Schaffer suggests, Aristotle’s view that substances are ontologically prior to all else can be understood as the view substances *ground* all else. Thus, Schaffer implies that grounding can be understood in terms of ontological priority: if X grounds Y , then X is ontologically prior to Y .⁸

J. Wilson (2014), though hostile to grounding, likewise makes the point that the notion of grounding is often understood in terms of ontological priority.⁹ As she explains (ibid., section 4), one of the basic theoretical roles that grounding is often posited in order to play is the role of fixing the direction of priority between entities that bear metaphysical relations which do not fix such a direction on their own. For instance, the metaphysical relation of composition might seem to work in this very way: the claim that simples compose composite objects fails to be informative about the direction of ontological priority between simples and composites. For although the direction of composition goes from simples to composites, this is consistent with the direction of ontological priority going in either direction; from simples to composites or from composites to simples.

⁸ Likewise, Schaffer (2009, 375) suggests that when Plato raises the famous *Euthyphro* dilemma, Plato is raising a question about ontological priority; which is to inquire about what grounds what. That is, the overt question presented by the Euthyphro dilemma—whether the pious is pious because the gods approve of it or if the gods approve of the pious because it is pious—amounts to the following question: is the quality of being pious ontologically prior to the gods’ approval or does the ontological priority go in the other direction? And as Schaffer suggests, this is the same as asking *what grounds what*: does the quality of being pious ground the gods’ approval or does the gods’ approval ground the quality of being pious? So again, Schaffer implies that grounding can be understood in terms of ontological priority: if X grounds Y , then X is ontologically prior to Y .

⁹ Also, see J. Wilson (Forthcoming).

As J. Wilson understands the matter, grounding is often posited as a distinct relation over and above other metaphysical relations in order to resolve this issue. For postulating a grounding relation which goes in a stipulated direction, from composites to simples for instance, fixes the direction of priority which was not fixed by the relation of composition itself. Such a characterization of the role of grounding thus implies that grounding can be understood on the basis of this role, and thus in terms of the ontological priority that it is often posited in order to fix the direction of.

Similarly, as Correia and Schnieder (2012, 1) introduce grounding to their readers, they offer various example of what they call “non-causal priority” and identify this with grounding. And putting the point very straightforwardly, Rabin and Rabern (2016) simply say: “Grounding is a relation of metaphysical priority. Intuitively, some entities, properties, or facts are metaphysically prior to, and more fundamental than, others. The grounded derive their being from that which grounds” (3).

I now turn attention away from the priority-based treatment and toward another predicational treatment of grounding: a treatment based on the notion of *ontological dependence*. Roughly, ontological dependence can be understood as a kind of non-causal dependence relation by which the existence of some entities depends upon the existence of other entities. To illustrate the relevant notion of dependence, it’s a natural thought that dispositional properties asymmetrically depend upon categorical properties in some non-causal and thus *metaphysical* or *ontological* way. For instance, the fragility of my bedroom window depends upon its chemical microstructure whereas the microstructure does not depend upon the fragility of the window. Further, because a given disposition depends upon its categorical basis and the given categorical basis does not depend upon the disposition, there is a sense in which these entities do not exist side by side ontologically

speaking: there is an ordering imposed upon these entities such that a categorical property ontologically *undergirds* the disposition which depends upon the given categorical property.

To provide another example, it was a common view of early modern philosophers to characterize properties and substances in terms of ontological dependence. On this characterization, properties depend upon substances whereas substances do not depend upon properties. So in this way, properties and substances can be conceived of in terms of how these entities are ordered by ontological dependence; i.e. with respect to which of these entities depend upon which. As with the example mentioned in the previous paragraph, due to the asymmetrical dependence between substances and properties, these entities do not exist side by side ontologically speaking: there is a sense in which substances ontologically *undergird* properties. Generalizing this conception of how entities stand to one another, we are provided with a worldview on which all of reality's contents assume a place within an ordering that is imposed by what depends upon what. Relying on this background, grounding is often framed in term of this relation of ontological dependence by which entities are so ordered: on the "*dependence-based treatment*" of grounding, if *X* grounds *Y*, then *Y* ontological depends upon *X*.¹⁰

To further elucidate this treatment, it will be helpful to point out that there are different *kinds* of ontological dependence¹¹ and to distinguish the kind which grounding is understood in terms of. Firstly, the relevant kind of ontological dependence is supposed to be unamenable to a purely-modal analysis, unlike a distinct kind of ontological dependence called "modal-existential dependence." To offer an example of example of modal-existential dependence to illustrate this

¹⁰ For examples of this treatment of grounding see Bliss (2013), Cameron (2008), J. Wilson (2014, Forthcoming) or Rosen (2010).

¹¹ For discussion of the different types ontological dependence relations see Correia (2008).

contrast, notice that there is ontological dependence between my liver and the null set: since the null set exists at all possible worlds; therefore, my liver can exist at a possible world W *only if* the null set exists at W . And notice the ontological dependence between my liver and the null set is successfully captured by a purely-modal description: at all possible worlds where my liver exists, the null set exists. In contrast to modal-existential dependence, the kind of ontological dependence associated with grounding is supposed to be unanalyzable in terms of modality; that is, a purely-modal analysis cannot be offered for this sort of ontological dependence.¹²

To point out another distinguishing feature of the ontological dependence associated with grounding, notice that the purely-modal dependence relation between my liver and the null set *does not correspond to or “back” an explanatory connection*: although my liver modally depends upon the null set, it being true that one of these entities exists does not explain it being true that the other exists. In contrast, the kind of ontological dependence associated with grounding *is* thought to back explanation: if X grounds Y , then it being true that Y exists is explained by it being true that X exists.

Further, purely-modal ontological dependence is *symmetric* in some cases. For instance, consider the null set and the number seven. Since both of these entities exist at all possible worlds, they bear a purely-modal ontological dependence relation: the null set can exist at a possible world W *only if* the number seven exists at W , and the number seven can exist at a possible world W *only if* the null set exists at W . In contrast, the kind of ontological dependence associated with grounding is supposed to be *asymmetric*, since grounding is standardly considered asymmetric. Thus, to more precisely state the dependence-based treatment, this treatment frames grounding in terms of the

¹² Hence, it is often said that the notion of grounding is appealed to for carrying out theoretical purposes which purely modal notions (e.g. necessitation) cannot be used for. More to be said about this below.

kind of ontological dependence which has these features just mentioned.¹³ So, re-stating this treatment: if X grounds Y , then the existence of Y depends upon the existence of X , and:

- The dependence between X and Y is unamenable to a purely-modal analysis.
- The dependence between X and Y corresponds to an explanatory connection, meaning that it being true that Y exists is explained by it being true that X exists.¹⁴
- The dependence between X and Y is asymmetric.

Now, summarizing this section, four predicational treatments of grounding have been elaborated. Each of these treatments present grounding via an association between the notion of grounding and another metaphysical notion: the notion of *hierarchical structure*, *fundamentality*, *ontological priority*, or *ontological dependence*.

No doubt, the discussion of these four treatments prompts the reader to wonder: aren't some or all of these four treatments of grounding the *same* treatment described in different ways? And indeed, this question needs to be answered if the discussion of grounding in the following chapters is to be clear. Thus, this question is addressed in the next section.

1.3. Unifying the Predicational Treatments of Grounding

In the chapters to follow, I will assume the predicational approach, and thus frame grounding as a relation. To do so, I will rely most heavily upon the dependence-based treatment. However, relying most heavily upon the dependence-based treatment will not result in the other three predicational treatments being disregarded. For as I will explain, the other three treatments can be understood in

¹³ For further discussion on the connection between grounding and ontological dependence, see Bliss and Trogon (2016) or Tahko and Lowe (2015, section 5).

¹⁴ I.e. “ Y exists” being true is explained by “ X exists” being true.

terms of the dependence-based treatment. Thus, these other treatments are implicitly captured by a discussion of grounding which is focused upon the dependence-based treatment.

Further, by proposing that the other three predicational treatments can be understood in terms of the dependence-based treatment, I will be proposing an answer to question raised at end of the previous section: aren't some or all of the predicational treatments of grounding the *same* treatment described in different ways? My proposed answer is *yes*: these are all different ways of presenting the same basic understanding of grounding.

This point is likely to be somewhat clear already, since the discussion of these predicational treatments above has made clear that each treatment presents the idea that what it is for X to ground Y is for X to *ontologically undergird* Y . Nonetheless, I will explicitly elaborate the point that these treatments present the same basic ideas and I will do by focusing upon another common theme among these treatments: the theme that grounding imposes a characteristic type of *ordering*. Thus, let's explicitly note how the hierarchy-based treatment, the fundamentality-based treatment and the priority-based treatment each present grounding in terms of some way that grounding *orders* entities.

Concerning the hierarchy-based treatment, it might not be obvious how this treatment implicitly presents grounding in terms of an *ordering*. But the idea is quite simple: to frame grounding in terms of the hierarchical *levels* which grounding imposes is to frame grounding in terms of the hierarchical *ordering* which grounding imposes. So on the hierarchy-based treatment, once again, if X grounds Y , this is taken to mean that X undergirds Y at a lower level of reality's hierarchical structure. And this is tantamount to treating grounding as the relation which imposes a hierarchical *ordering* upon entities.

It is more obvious how the fundamentality-based treatment and the priority-based treatment implicitly present grounding in terms of orderings. On the fundamentality-based treatment, once again, if X grounds Y , this is taken to mean that X is fundamental to Y . And this is tantamount to treating grounding as the relation which imposes a fundamentality *ordering* upon entities. On the priority-based treatment, if X grounds Y , this is taken to mean that X is ontologically prior to Y . And this is tantamount to treating grounding as the relation which imposes an *ordering* of ontological priority upon entities. So, all three of these treatments focus upon some sort of ontological ordering and each treats grounding as the relation which imposes that ordering.

Now, as I suggest, the dependence-based treatment can be used to capture each of these other treatments by defining each of these orderings in terms of ontological dependence; i.e. treating each of these orderings as an ordering of ontological dependence.¹⁵ Thus, I suggest that X being prior to Y in a *hierarchical ordering* is to be understood as X being prior to Y in an ordering of ontological dependence, meaning: Y ontologically depends upon X . By employing this understanding of a hierarchical ordering, any claim about grounding which is framed via the hierarchy-based treatment can be translated into a claim about grounding which is framed via the dependence-based treatment: if “ X grounds Y ” is taken to mean “ X undergirds Y at a lower level of reality’s hierarchical structure,” this can be translated into “ Y ontologically depends upon X .”

Likewise, I suggest that X being prior to Y in an *ordering of ontological priority* is to be understood as X being prior to Y in an ordering of ontological dependence, meaning: Y ontologically depends upon X . By employing this understanding of an ordering of ontological priority, any claim about grounding which is framed via the priority-based treatment can be

¹⁵ More specifically, my suggestion is that each of these orderings are treated as the ordering imposed by the kind of ontological dependence which the dependence-based conception frames grounding in terms of; i.e. the kind which has the features specified earlier which distinguish it from purely-modal ontological dependence.

translated into a claim about grounding which is framed via the dependence-based treatment: if “*X* grounds *Y*” is taken to mean “*X* is ontologically prior to *Y*,” this can be translated into “*Y* ontologically depends upon *X*.”

Lastly, I suggest that *X* being prior to *Y* in a *fundamentality ordering* is to be understood as *X* being prior to *Y* in an ordering of ontological dependence, meaning: *Y* ontologically depends upon *X*. By employing this understanding of a fundamentality ordering, any claim about grounding which is framed via the fundamentality-based treatment can be translated into a claim about grounding which is framed via the dependence-based treatment: if “*X* grounds *Y*” is taken to mean “*X* is fundamental to *Y*,” this can be translated into “*Y* ontologically depends upon *X*.”¹⁶

In this way, the dependence-based treatment can be used to capture the three other predicational treatments of grounding. And indeed, each of the other treatments can be used to capture the dependence-based treatment. For one might define ontological dependence in terms of any of the orderings which the three other treatments focus upon: *Y* being ontologically dependent upon *X*, and thus *X* being prior to *Y* in an ordering of ontological dependence, can be understood as *X* being prior to *Y* in a hierarchical ordering or a fundamentality ordering or an ordering of ontological priority. And this means that the translations mentioned above go in both directions: any claim about grounding framed via the dependence-based treatment can be translated in a claim about grounding which is framed via any of the other three predicational treatments. This demonstrates how all four treatments can be understood *as the same treatment*. For the other three

¹⁶ And to explicitly clarify how the distinction between absolute vs. non-absolute fundamentality is accommodated by this translation-scheme, the *Xs* being *absolutely* fundamental would be understood such that: the *Xs* are among the minimal elements in reality’s ordering of ontological dependence and thus the *Xs* ontologically depend upon nothing. And, the *Xs* being *non-absolutely* fundamental would be understood such that: although the *Xs* are not the minimal elements of in reality’s ordering of ontological dependence, and thus the *Xs* are ontologically dependent, some entities depend upon the *Xs*. Or more simply put, although the *Xs* are not located at the first node of reality’s ordering of ontological dependence, they are prior to some other entities in this ordering.

treatments can be understood in terms of the dependence-based treatment and the dependence-based treatment can be understood in terms of the other three. Hence my positive response to question raised earlier: aren't some or all of the predicational treatments of grounding the *same* treatment described in different ways?

Now, since it has been shown how these four treatments can be understood in terms of one another, what should be addressed is why I choose to focus upon the dependence-based treatment in the chapters to follow. I choose to do so because, although the dependence-based treatment can be framed in terms of the other treatments, there is something preferable about the dependence-based treatment. The dependence-based treatment offers a more *direct* treatment of grounding in the following respect. Once again, the hierarchy-based treatment, the fundamentality-based treatment and the priority-based treatment each present grounding in terms of some way that grounding is thought to *order* entities. So, because grounding is presented by these treatments as that which imposes an ordering of some type, the *ordering* that grounding imposes *rather than grounding itself* is what these treatments focus upon to frame grounding. Hence, these three treatments capture grounding *indirectly*: via an ordering which grounding is thought to impose, rather than grounding itself.

To elaborate, on the hierarchy-based treatment, grounding is characterized as that which imposes hierarchical ordering, and this treatment goes no further: it goes only as far as *indirectly* characterizing grounding in terms of this specific type of ordering which grounding is purported to impose. Likewise, on the priority-based treatment, grounding is characterized as that which imposes orderings of ontological priority, and this treatment goes no further: it goes only as far as *indirectly* characterizing grounding in terms of this specific type of ordering which grounding is purported to impose. Lastly, on the fundamentality-based treatment, grounding is characterized as that which

imposes fundamentality orderings, and this treatment goes no further: it goes only as far as *indirectly* characterizing grounding in terms of this specific type of ordering which grounding is purported to impose.

This should make clear how the dependence-based treatment goes a crucial step further than these indirect characterizations offered by the other three predicational treatments. The dependence-based treatment describes grounding *directly*, by specifying that grounding is a relation of ontological dependence. So, like the three other treatments, the dependence-based treatment does indeed characterize grounding indirectly in terms of an ordering it imposes; i.e. an ordering imposed *by* ontological dependence. But this is *in addition* to the direct characterization it offers such that it describes grounding as a kind of ontological dependence. So as I see the matter, the dependence-based treatment is theoretically superior in this way and thus it is preferable to the other three predicational treatments.

This is why I will rely most heavily on the dependence-based treatment in the chapters to follow. Though, at times, the other predicational treatments will be put to use in the discussion below to articulate some claims about grounding; when employing these other treatments is advantageous or unavoidable. But although these other treatments will sometimes arise in the discussion, the use of these different predicational treatments is to be understood as different ways of discussing the same basic understanding of grounding. For as I have explained, the major difference between these four predicational treatments is a difference of *presentation*. And to reiterate, the focus upon the dependence-based treatment below does not lead to a disregard for the other treatments: since the other treatments can be understood in terms of the dependence-based treatment, these other treatments are implicitly captured by a discussion of grounding which is focused upon the dependence-based treatment.

1.4. Further Features of Grounding

To provide more detail to the outline of grounding provided in this chapter, I now turn attention to various features that are sometimes or often attributed to grounding.

Very often grounding is treated as *irreflexive, asymmetric and transitive* and accordingly the ordering that grounding imposes is often thought to be a *partial ordering*.¹⁷ Further, grounding is standardly considered *factive*: if some fact F grounds F^* , then F and F^* obtain. Likewise, grounding is commonly considered *non-monotonic*: if X grounds Y , it does not follow that Y is grounded by X and any other fact. Most often, grounding is thought to be *unitary* in the sense that claims about grounding or locutions used to speak of grounding pick out a single relation.¹⁸ On the contrasting view, claims about grounding or locutions used to speak of grounding pick out variegated relations of dependence.¹⁹

Further, grounding theorists often make a distinction between *full* grounds (also sometimes called “whole” grounds) and *partial* grounds, such as follows. If entities $X_1 \dots X_n$ suffice to ground Y independently of any additional entities, $X_1 \dots X_n$ thus serve to *fully* ground Y in the sense that they serve as the exhaustive and sufficient set of grounds for Y . Grounding is considered *partial* in the following sense. If Y is fully grounded by X and Z , then X only *contributes* to Y being grounded and so X does not by itself suffice for Y being grounded: X is among the plurality of entities which comprehensively serve as the sufficient grounds for Y .

¹⁷ See Cameron (2008) or Raven (2013). Though, see Jenkins (2011) for a challenge to grounding’s irreflexivity and Schaffer (2012) for a challenge to grounding’s transitivity. See Rodriguez-Pereyra (2015) for a challenge to grounding having *any* of the features of irreflexivity, asymmetry or transitivity.

¹⁸ See Audi (2012b), Rosen (2010), Schaffer (2009) or Witmer, Butchard, and Trogdon (2005).

¹⁹ See Daly (2012), Hofweber (2009), Koslicki (2015) or J. Wilson (2014).

A more controversial feature of grounding concerns its alleged *well-foundedness*:²⁰ though it is a common view that chains of entities connected by grounding relations are necessarily well-founded and thus grounding is necessarily a well-founded relation, this issue has recently become the focus of a growing dispute.²¹ Concerning another point of controversy, grounding is sometimes treated as a *singular-to-singular* relation²² (as it has been treated by much of the discussion thus far), sometimes as a *singular-to-many* relation,²³ and sometimes as a *many-to-many* relation.²⁴ Much disagreement about this issue persists.

Recently some controversy has also arisen concerning grounding's modal profile.²⁵ Most accounts treat grounding as metaphysically necessary²⁶ in the sense that if *X* (fully) grounds *Y*, then at each possible world where *X* obtains, *Y* obtains as well.²⁷ Or as Correia (2005) puts it: “Necessarily, if *the fact that A* is grounded in some given facts, then it is impossible that the latter facts all exist but fail to ground *the fact that A*” (65).²⁸ However, some focused attention has been

²⁰ This issue is addressed in depth in chapter 4.

²¹ For challenges to grounding's well-foundedness see Morganti (2009) or Orilia (2009).

²² See Schaffer (2009).

²³ See Rosen (2010).

²⁴ See Dasgupta (2014).

²⁵ This issue is addressed in depth in chapter 3.

²⁶ Some who endorse this view include Audi (2012b), deRosset (2010), Fine (2012), Rosen (2010) or Trogon (2013b).

²⁷ This formulation of the metaphysical necessity contrasts with a weaker formulation. On this weaker formulation, if *X* ground *Y*, then at every world at which *X* obtains, *Y* does as well. What this weaker formulation fails to include—which this stronger formulation *does* include—is the grounding connection itself between *X* and *Y*. That is, on this weaker formulation, grounding entities necessitate the entities they ground in the sense of the entities coexist at each world that they obtain and nothing more: it is not stipulated that a grounding relation obtains between them at each world where they coexist.

²⁸ That is, every possible world at which the given *grounding* entities obtain, the given *grounded* entities *Y* obtain. This is discussed further in chapter 3.

devoted in recent literature to establishing the view that grounding is contingent in some cases, meaning that for some cases in which the full grounds F for some grounded entity Y , F obtains at some possible worlds without Y obtaining at those possible worlds.²⁹

On virtually all accounts, grounding is an explanatory relation or an explanation *backing* relation—a theme discussed above. To reiterate the point: if X grounds Y , then it being true that Y exists is explained by it being true that X exists.³⁰ And the kind of explanation that grounding is thought to back is supposed to be a kind of *non-causal* explanation or what is sometimes called *metaphysical* explanation. With this in mind, the relevant point can be re-stated: if X grounds Y , then it being true that Y exists is *non-causally* / *metaphysically* explained by it being true that X exists.³¹ To quickly illustrate with an example, it being true that my nephew Alex is in a pain state can be explained by appeal to it being true that his brain is undergoing the kind of neuro-chemical process that is fundamental to a pain state (c-fiber stimulation, or what have you). Notice that the explanation in this case is backed by an *is-fundamental-to* relation between Alex's relevant states. So because grounding can be understood as the *is-fundamental-to* relation (as suggested by the fundamentality-based treatment), the explanation in this case is backed by a grounding relation. So in the same way that causal relations are thought to correspond to causal explanations, grounding relations are thought to correspond to *grounding* explanations: explanations in which the given explanandum is explained by appeal to what it is that grounds it.

²⁹ See Leuenberger (2013) or Skiles (2015) for focused defenses of the view that grounding is contingent in some cases. Others who accept this view include Dancy (2004) and Schnieder (2006).

³⁰ Sources differ greatly in how they attempt to elaborate this. And indeed, there is not much rigorous elaboration available concerning the explanatory connection that grounding is supposed to back. Nonetheless, the bare claim that there *is* an explanatory connection between grounds and grounded is standardly assumed.

³¹ See Audi (2012b), deRosset (2010, 2013), (Fine 2012), Schaffer (2015) or von Solodkoff (2012).

Finally, most leading accounts regard the notion of grounding as a primitive in the sense that grounding cannot be reductively defined in more basic terms, and no necessary and sufficient conditions can be established for grounding.³² On such accounts, although the concept resists reductive analysis, the concept of grounding is intelligible, useful and characterize-able in terms of related notions (i.e. the notions of fundamentality, dependence, etc.) and various features and formal properties, such as those just mentioned in this section.

1.5. The Operational Approach to Grounding and Its Central Problems

Thus far, the discussion has been concerned with only the predicational approach to grounding. And so the discussion has overlooked the alternative approach, an approach which has played a comparably significant role in shaping the development of recent thought about grounding.³³ To explain why the discussion to follow will continue to be focused on the predicational approach only, in this section I address why I reject the alternative approach, and thus why it will be intentionally overlooked in the discussion to follow below.

To reiterate, the predicational approach regiments grounding as a relational predicate which is flanked by singular terms that stand for entities. In contrast, the “*operational*” approach regiments grounding as a sentential connective or operator that is flanked by sentential expressions.³⁴ To illustrate, let’s use Fine (2012)’s arrow denoted as “>” in order to notate the grounding connective, in which case the closed end of the arrow points towards the sentence that serves as the given

³² I have in mind here the accounts proposed by Fine (2001, 2012), Rosen (2010) and Schaffer (2009).

³³ For an overview and comparison of these approaches, see Bliss and Trogdon (2016), Clark and Liggins (2012), Schaffer (2015) or Trogdon (2013a).

³⁴ See Correia (2010), Clark and Liggins (2012) or Fine (2001, 2012).

ground and the open end of the arrow faces the sentence that serves as what is grounded. Using this to notate the grounding statement “Alex’s brain state *BS* grounds Alex’s mental state *MS*” we get: Alex is in state *MS* > Alex is in state *BS*. As the operationalist might suggest, the connective can be expressed informally as “because” or “is grounded by,” and hence doing so for this example we would give us: “Alex is in state *MS* *because* Alex is in state *BS*” or “Alex undergoing state *MS* *is grounded by* Alex undergoing state *BS*.”

A crucial feature of the operational approach is that it is thought to grant the operationalist an ontological neutrality which the predicational approach does not offer. Firstly, because the operationalist does not treat grounding as a relation, the operationalist is not thereby ontologically committed the existence of relations. In contrast, the predicationalist *is* so committed for the obvious reason that the predicationalist treats grounding as a relation. So if one wishes to deny or remain neutral about the existence of properties and relations, the operational approach allows one to do so, whereas the predicational approach does not. Secondly, because the operationalist does not treat grounding as relation she can therefore avoid any ontological commitment to that which would serve as the *relata* of a grounding relation, such as facts, propositions, substances, etc. Again, the predicational approach cannot avoid this ontological commitment for this approach’s commitment to relations results in a commitment to whatever is thought to serve as the *relata* of relations.

As Bliss and Trogon (2016, section 3) illustrate with an example:

[Operationalists] can agree, for example, that you can vote because you’re a citizen and that this is a grounding claim, but in so doing [operationalists] aren’t committed to the existence of propositions or facts (e.g., the proposition/fact that you can vote and the proposition/fact that you’re a citizen) or relations (the grounding relation that holds between these propositions/facts).

This ontological neutrality serves as one of the main motivations for adopting the operational approach: because the predicational approach does not afford this neutrality, whereas the

operational approach does, operationalists often cite this as the basis of their preference for this approach. For instance, Clark and Liggins (2012) make it very explicit that this is their basis of choosing the operational approach (what they call a “connective theory”):

Our choice between predicate and connective theory [of grounding] bears on our metaphysical account of grounding. For it is standard to think that predicates pick out relations; if so, the predicate view entails that grounding claims imply the existence of grounding relations and their relata. This does not seem to apply to the connective theory, for sentential connectives (‘and’ and ‘if ... then ...’, for example) are not generally taken to pick out relations. This is why friends of the connective theory sometimes claim that considerations of ontological neutrality favor their view. (818)³⁵

My reasons for rejecting the operational approach are focused upon this neutrality. Firstly, I simply do not seek to maintain the ontological neutrality which the operational approach allegedly affords. For I consider the ontological commitments of the predicational approach to be perfectly acceptable and thus I do not find the ontological neutrality of the operational approach to be a persuasive basis for choosing it over the predicational approach.

Secondly, even though I do not seek to achieve the alleged ontological neutrality of the operational approach, I propose that the way the operational approach is usually understood is fundamentally confused. For it is typical of operationalists to claim, as just described, that this approach allows them to be ontologically neutral about what grounding statements (i.e. statements of the form “*X* grounds *Y*”) portray about the world. That is, I think the operationalist treatment of grounding cannot grant one who adopts it as strict of an ontological neutrality as the operationalists typically claim.

To make precise the explanation of this issue, let’s introduce some terminology. Call the “*G*-operator” the operator which the operationalist uses to regiment grounding statements. Call “*G*-

³⁵ Further, see Correia (2010, section 1.1) or Fine (2012, section 4).

sentences” sentences which are formulated by use of the *G*-operator and hence which are sentences of the form “*P* because *Q*” or [*P* > *Q*]. Thus *G*-sentences are the sentences that the operationalist would use in order to speak of the phenomenon of grounding. Note that *G*-sentences are complexes which are built from more basic sentences that serve as the constituents of *G*-sentences: the complex sentence “*P* because *Q*” is built from the more basic sentences *P* and *Q*. Call “*C*-sentences” these more basic sentences which are constituents of *G*-sentences.

Now, to begin to explain why the operationalist cannot maintain as strict an ontological neutrality as they wish, let’s note that it’s obvious and undeniable that one of the most basic goals of theorizing about grounding is to theorize about something *ontological*; for grounding is an ontological phenomenon (in contrast to a more thoroughly epistemic or logical phenomenon or what have you). So in order for grounding statements to be statements which are *about* grounding, grounding statements must be *representational* statements (i.e. representations of ontological phenomena) regardless of however they are logically formulated.

Since what I’m calling *G*-sentences are grounding statements which are regimented as the operationalist chooses to regiment them, *G*-sentences must be representational of the world if the operational approach is to be a theoretical approach *about* an ontological phenomenon. Otherwise the very view which we are calling the “operational approach to grounding” would end up being a view which is only about how some sentences should be formulated; nothing more (not a view which is about some ontological phenomenon which these sentences might otherwise be considered to represent). I propose that if *G*-sentences are indeed representational, it turns out that the ontology represented by that *G*-sentences is not significantly differently than the ontology of the predicational treatment of grounding. So the ontological neutrality that is allegedly afforded by the operational treatment of grounding does not hold.

To explain this, I propose first that since *G*-sentences are representational, *C*-sentences must be representational. To illustrate, consider the *G*-sentence “*P* because *Q*.” The natural reason for thinking that this is representational is that its constituent sentences *P* and *Q* are representational. So the idea is that the *C*-sentence *P* being representational and the *C*-sentence *Q* being representational is what makes the complex *G*-sentence “*P* because *Q*” representational. To elaborate further, let’s imagine that *P* and *Q* were *not* representational. If these *C*-sentences were not about the world, then this would seem to rule out the idea that that the *G*-sentence “*P* because *Q*” is about the world. So in order for “*P* because *Q*” to be representative of the world, its constituent sentences *P* and *Q* must be likewise be representative.³⁶ We need not specify or commit ourselves to *what* *C*-sentences represent; the point is only that there must be *some* subjects of representation which are ontological, be they substances bearing properties or facts, or whatever.

I propose next that *C*-sentences are *ordered* sentences, at least, they are ordered insofar as they are embedded within a *G*-sentence. Consider again “*P* because *Q*.” Insofar as *P* and *Q* are embedded within “*P* because *Q*” and thus are embedded in a *G*-sentence, *P* and *Q* are ordered by the *G*-operator that operates upon both of them within this *G*-sentence. Specifically, as constituents of this *G*-sentence, these *C*-sentences *P* and *Q* are ordered in the sense that these *C*-sentences are made to bear an asymmetry that is imposed by the *G*-operator: the *G*-operator serves to provide a one way directionality *from* one *C*-sentence (*Q*) *toward* another (*P*) such that one *C*-sentence obtains *because of* the other (*P* obtains because of *Q*). Putting this point together with the point established

³⁶ To provide an example, say the *G*-sentence “*P* because *Q*” is supposed to be about Alex undergoing a mental state and this being grounded by Alex undergoing a brain state. If the *G*-sentence “*P* because *Q*” is to somehow be representational of this occurrence, then it would seem that what must be the case is this: *P* must be representational of Alex undergoing a mental state and *Q* must be representational of Alex undergoing a brain state. If *P* and *Q* are *not* representational of Alex undergoing a mental state and a brain state respectively, then “*P* because *Q*” could not be representational of this token instance of grounding. Generalizing this thus provides us with the point at hand: if *G*-sentences are representational, then the *C*-sentences are representational, for *C*-sentences *being* representational is what makes *C*-sentences representational. We need not specify *what* *C*-sentences represent; the point is only that *something ontological* is represented by them, be it substances bearing properties or facts, etc. The point is only that there must be *some* subjects of representation which are ontological.

from the previous paragraph, we thus get the idea that *C*-sentences are representational and they assume an ordering.

Now, more terminology will be useful: call the ontological phenomena which *C*-sentences serve to represent “*C*-subjects” (*C*-sentences’ subjects of representation). I propose next that that *C*-subjects are ontologically ordered in a way that corresponds to the ordering of the *C*-sentences which represent *C*-subjects. To establish this, I point out that if indeed *G*-sentences are to represent *more about the world*, then *G*-sentences must represent more than the sum of what their constituent *C*-sentences represent: if indeed *G*-sentences are to represent *more about the world*, then the ordering that a *G*-sentence imposes upon its constituent *C*-sentences must reflect an ontological ordering of the *C*-subjects which are represented by the given *C*-sentences. That is, for a sentence of the form “*P* because *Q*” to represent more than just the sum of what *P* and *Q* represent, the ordering imposed upon *P* and *Q* by the “because” locution must correspond to an ontological ordering of the *C*-subjects that *P* and *Q* represent.³⁷

Thus, we have established that *C*-sentences are representational, that *G*-sentences are representational via their constituent *C*-sentences being representational, that *C*-sentences are ordered, and that the ordering of *C*-sentences corresponds to an ontological ordering assumed by what *C*-sentences represent (i.e. their *C*-subjects). What follows from this is the crucial claim that *G*-sentences are representational of ontological phenomena which bear an order-imposing relation. That is, because the

³⁷ To see why this is plausible, assume it is false: assume that *C*-subjects did *not* have an ordering that corresponds to the ordering of their representative *C*-sentences (which are embedded within a *G*-sentence). If this were the case, then the given *G*-sentence which is built from these given *C*-sentences would serve to represent *only* the sum of whatever is represented by *P* and *Q*: all that the *G*-sentence “*P* because *Q*” would reflect about the world is just the sum of whatever *P* reflects about the world together with whatever *Q* reflects about the world. But of course, what it is that “*P* because *Q*” would reflect about the world, if this *G*-sentence is indeed representational, is *more* than just the sum of whatever it is that *P* reflects and whatever it is that *Q* reflects. The very idea that “*P* because *Q*” is representational of the world is the idea that whatever *P* reflects and whatever *Q* reflects are *connected* in some way that is captured by the “because” locution and thus by the *G*-operator. Hence the ordering imposed upon *P* and *Q* by the *G*-operator must correspond to an ontological ordering that belongs to whatever *P* represents and whatever *Q* represents; the *C*-subjects which *P* and *Q* represent that is.

ontological phenomena that are represented by *G*-sentences (via their constituent *C*-sentences) includes ontological phenomena which are ordered, these ontological phenomena must bear a *relation* which serves to *impose* the ordering they assume. So even if one regiment's grounding statements as *G*-sentences, one *is* therefore committed to relations. Further, because one would be committed to relations in this way, one would also be committed whatever it is that serves as the *relata* of these relations. These ontological commitments are the very commitments which the ontological neutrality of the operationalist approach is supposed to avoid. Hence, this neutrality that is allegedly afforded by the operational approach is not so afforded.

This would seem to imply the following broader idea concerning the operational treatment. This treatment of grounding would seem to be a means of *logical expression* about the phenomenon in question: the order-imposing relation called "grounding." The treatment does not seem to present an ontological treatment which is very different from its competitor; the predicational approach to grounding. Further, since the operational approach is focused upon the *G*-operator rather than the grounding relation itself, and since this approach is focused upon the regimentation of grounding statements rather than the grounding relation itself, I think this approach is too distanced from the very phenomenon under investigation. That is, to my mind, the operational account is so focused on statements about grounding and how to regiment them that this approach is not satisfyingly focused upon the very thing in question: the nature of grounding itself.

These points are similar and closely connected to the following point that Schaffer (2015) raises in criticism of the operational approach. As Schaffer proposes, the operationalist conflates the image of an explanation-backing relation with the image of an explanation itself. Sentences of the form of that *G*-sentences assume are, in effect, explanations: for if "*P* because *Q*" is true, then *Q* obtaining explains *P* obtaining. As Schaffer points out, it is a confusion to equate this explanation

with the worldly entities that the explanation is *about*: the explanation, if it is an explanation about something *ontological*, must be a reflection of some entities bearing an explanation-backing relation.

Schaffer elaborates by using the analogy of causal explanation. Say E causes E^* and thus E causally explains E^* . As Schaffer suggests, it would be confused to equate E *causing* E^* with E *causally explaining* E^* . He suggests that the operationalist is engaging in this same kind of confusion for grounding: the operationalist is failing to abide by the distinction between explanations about ontological phenomena on one hand, and the ontological phenomena being explained, on the other. When the operationalist parses a claim about grounding in the way that she would parse them—i.e. in the form “ P because Q ” where P and Q are sentences—such claims are better understood as explanations that are backed by and representative of worldly relations between entities. Just as a set of sentences that together comprise a causal explanation are to be understood as *linguistic representations* of events bearing causal relations, operationalist-style grounding claims should also be understood as *linguistic representations* of things bearing grounding relations. Above I suggested that the operationalist avoids the need to recognize ontological phenomena bearing the relations which order them and the operationalist is overly focused upon regimentation rather than upon grounding itself. These suggestions seem to be echoed quite loudly by Schaffer’s own critical remarks here.

For all these reasons, my preferred approach to theorizing about grounding is to do so via the use of the predicational approach. Thus, the discussion to follow intentionally overlooks the operational approach.

1.6. The Similarity between Grounding and Causation and the Impetus to Explore Their Identification

Now that the needed background has been provided, the central question of the discussion to follow can be posed. This is the question: in what respect should grounding and causation be considered distinct relations, and how plausible is the view that they are *not* distinct relations (and thus, are numerically identical relations)? What motivates this question, and thus serves as the basic impetus for the discussion to follow, is the profound and unmistakable similarities between grounding and causation. To thus motivate this question, I turn attention in this sub-section to a number of the respects in which these relations resemble one another. Further, the list of similarities to be assembled below will later play an additional role in the overall discussion. Not only is this list of similarities the motivation for the discussion, the similarities will serve as the basis of one of the main arguments to be discussed in chapter 2. To quickly make clear just how the similarities will later play this other role just mentioned, the gist of that argument is this: because the similarities between the relations are so remarkable and systematic, it's very plausible to think the relations are identical, since them being identical explains *why* the relations bear such similarities.

To now discuss these similarities, what is perhaps the most striking similarity is that causation and grounding are both relations by which ontological *production* occurs: when these relations obtain, some entity (such as an event, a fact, a substance, etc.) produces another. Putting the point in terms of locutions other than “produce” or “production,” we could say that the relations resemble one another in the respect that they both serve to *generate* or *give rise to* or *determine* or *bring about* or *make* entities obtain, and so on. Other locutions that can be used to speak of this productive feature that the relations share include *in virtue of*, *because of*, *due to*, *given that*, *as the result of*: if *X* causes or grounds *Y*, then it can be said that *Y* obtains *in virtue of X* or that *Y* obtains *because of X*, and so on.

Second, as already mentioned, both relations are explanation-backing relations: if X either causes or grounds Y , X explains Y . More specifically, causation and grounding back *why*-explanations. To clarify, the distinction being appealed to here is a distinction between *why*-explanations, meaning explanations by which it is explained *why* something is the case, and *that*-explanations, meaning explanations by which it is explained *that* something is the case. For example, hearing a shattering sound in the next room explains *that* the window in the next room has shattered, though it does not explain *why* the window has shattered. Finding a baseball on the floor in that room, which contained no baseballs prior to the shattering, explains *why* the window shattered. For one can infer that the baseball collided with the window, thus shattering it and entering the room.

That-explanations are weaker than why-explanations in the following respect. That-explanations serve to justify the belief that P is the case without allowing for an understanding of what brought P about and thus *why* P is the case. In contrast, why-explanations of P *do* allow for an understanding of what brought P about and thus why P is the case. Given that these explanations allow one to understand why P is the case, they also serve to justify the belief that P is the case. For if explanation E elucidates what brought about P , then E will also elucidate the very fact *that* P was indeed brought about and thus that P holds.

Third, as mentioned above, both relations are often considered irreflexive, asymmetric and transitive. Thus, both relations are often considered to impose a *partial ordering* upon their relata. This connects to the fourth similarity which I will mention: since causal and grounding relations impose a determinative *asymmetry* between their relata (i.e. they impose an asymmetry by which the relatum on one side of the relation is *determined* by the other relatum and not vice versa), these relations serve to

ontologically order and thus ontologically *structure* the contents of reality.³⁸ Hence, both relations impose ontological structure upon the world.

Fifth, both relations are *lawful* relations in the following sense. If a causal relation or grounding relation holds between X and Y , this is an instance of a lawful generality such that entities of the kind that X belongs to cause or ground entities of the kind that Y belongs to. This is a familiar point for causal relations but perhaps it is worth elaborating this point concerning grounding relations. To illustrate this point, let us consider truthmaking and composition (concerning material composites), both of which can be understood as species of grounding.

Truthmaking is often considered a grounding relation in the sense that if the obtaining of fact F is the truthmaker for the proposition P , F grounds the truth of P . Now, the thought that the obtaining of this grounding relation between F and the truth of P is a lawful occurrence is the simple thought that the following holds. F grounding the truth of P is an instance of the lawful generality that grounding relations obtain between these specific kinds of entities—facts and propositions—under those same specific conditions: when a proposition P represents the obtaining of some fact F , P is made to be true by F . Thus it is a lawful occurrence that the truth of P is grounded by F .

To illustrate the same point with the example of composition, say simples S_1 and S_2 satisfy the necessary and sufficient conditions for composition, whatever they are, and so these simples compose C and thus ground C . The thought that the obtaining of this grounding relation is a lawful occurrence is the simple thought that the following holds. C being grounded by these simples (which

³⁸ To clarify, the idea here is that not just any asymmetry between entities amounts to ontological structure. Indeed, many asymmetric relations impose an ordering upon their relata but would seem to *not* impose ontological structure, such as any comparative relations like the more-massive-than relation or the taller-than relation. What is distinctive about the specific kind of asymmetry that holds in an ordering imposed by causation or grounding is that this kind of asymmetry bears a *determinative* quality: if X causes or grounds Y and thus these relata bear an asymmetry which is directed from X towards Y , there is a determinative quality to this asymmetry such that some intrinsic fact about Y holds *because of* X . In contrast, the asymmetry between X and Y which is imposed by the more-massive-than relation or the taller-than relation is not an asymmetry by which some intrinsic fact about one of the relata holds *because of* the other.

satisfy the relevant conditions) is an instance of the lawful generality that grounding relations obtain between these specific kinds of entities—simples and composites—under those same specific conditions. That is, when simples meet the necessary and sufficient conditions for composition, those simples compose and thus ground a composite entity. Thus it is a lawful occurrence that C is grounded by F .

Sixth, both causation and grounding correspond to counterfactuals. Focusing on causation first, token causal relations correspond to counterfactuals in the sense portrayed by the schema: if $[\neg C \rightarrow \neg E]$ holds, then C causes E . To illustrate, if the counterfactual “if Alex hadn’t dropped my mug, then it wouldn’t have broken” is true, then Alex dropping the mug caused it to break.

Of course, accounts that seek to analyze causation purely in terms of counterfactuals are subject to various problems. But although it is commonly thought that causation is not to be understood entirely in terms of its connections to counterfactuals, it would seem to be widely recognized that there is something crucial about causation which is captured by counterfactuals. As Psillos (2002) puts it: “Almost everybody agrees that counterfactual conditionals play an essential role in causation. But there is important disagreement on what exactly that role is.” Thus, although causation is not to be understood entirely in terms of its connections to counterfactuals, it might be considered an important and revealing feature of causation that token causal relations tend to correspond to counterfactuals.

Interestingly, grounding relations correspond to counterfactuals, just as causal relations: if $[\neg X \rightarrow \neg Y]$ holds, then X grounds Y . To illustrate, listed below are several examples of grounding relations and their corresponding counterfactuals:

- Example of grounding 1: The existence of Socrates grounds the existence of the set S which contains only Socrates.

- Corresponding counterfactual 1: “If Socrates did not exist, then S would not have existed.”
- Example of grounding 2: Alex being in brain state B grounds Alex being in metal state M .
 - Corresponding counterfactual 2: “If Alex was not in brain state B , then Alex would not have been in metal state M .”
- Example of grounding 3: My window possessing microstructure MC grounds my window being fragile.
 - Corresponding counterfactual 3: “If my window did not possess microstructure MC , then my window would not have been fragile.”

Thus, causation and grounding both correspond to counterfactuals. And to be clear, this is not to suggest that either of the relations should be *understood* in terms of counterfactuals, nor that they *can* be entirely understood that way. The point is that, firstly, it might be considered an important and revealing feature of causation that token causal relations tend to correspond to counterfactuals. So, to the extent that this feature of causation is considered important and revealing, there is an interesting parallel with grounding. Secondly, the more basic point here is just that, regardless of the importance that one might attribute to this feature of causation, this feature is yet another feature which causation shares with grounding.

Turning now to the final similarity between the relations which I will discuss, this next similarity is quite elaborate. As Schaffer (2015) demonstrates, a precise formalism used for mathematically regimenting casual relations can be used in an *identical* fashion for regimenting grounding relations. What this shows is that, even at a mathematically rigorous conceptual level by which dependencies are represented via a precise formalism, the likeness between the relations does

not dissolve. Rather, the likeness between the relations is sustained, even at this level of formal precision. The likeness between the relations being so resilient would seem to suggest that the likeness is not superficial.

As Schaffer (2015) approaches this issue, he focuses upon the specific kind formalism which he defends as being the most precise and most advantageous kind of formalism currently available for causation: structural equation models,³⁹ most well-known perhaps from the work of Hitchcock (2001), Pearl (2000) or Woodward (2003). On Schaffer's preferred way of constructing such causal models,⁴⁰ these models are constructed via the use of a "tripartite structure;" i.e. a three-stage process, presented below as Schaffer (2015) implements it.⁴¹

Stage one: variables and a "signature" for these variables are introduced for the purpose of mathematically representing the "system under study," to thus ultimately regiment a causal influence between features of this system once the entire model is built. The relevant variables come in two

³⁹ In section 2.1 he defends the idea that this kind of formalism for causal influence is the most precise and advantageous available by appeal to various points. Concerning precision, Schaffer offers an illustrative contrast: he contrasts how precisely structural equation models can be used to determine the causal influences of a given phenomenon *P* with how precisely rival methods can be used for determining the causal influences of *P*. As he proposes, because rival methods for assessing causal influences are "irremediably vague about crucial details," they fail to offer a precision in their method which competes with the rigorous precision offered by the mathematical "causal discovery algorithms" that work via the use of structural equation models. For instance, among the rival methods he mentions, there's the method of assessing causal influence which is afforded by the Lewisian counterfactual treatment of causation: imagine the nearest possible world, imagine a "local miracle" to occur at that world which prevents one of the suspected causal influences on *P* to not obtain at that world, and to discern if *P* fails to obtain at that world as it does at the actual world. Concerning why this Lewisian-style method of assessment is "irremediably vague," what's hinted at is that this method possesses an imprecision due to the lack of clarity concerning how one is to correctly select the nearest possible world and also perhaps due to the vagueness of the idea of a local miracle. Secondly, Schaffer proposes that structural equation models are more advantageous than rival accounts because the wide variety of causal notions that can be integrated by these models is unparalleled by any alternative account. These include the causal notions of counterfactuals, interventions, "screening-off" relations, type vs. token causation and component influence vs. net influence. Lastly, Schaffer mentions the epistemological "breakthroughs" afforded by the use of structural equation models: algorithms based on such models can be used "to estimate causal structure from sufficiently, rich correlational structure over three or more variables," thus allowing for the breakthrough that causal influence can be inferred from correlation, which was previously not possible.

⁴⁰ He credits this to Halpern (2000).

⁴¹ The rest of the quotes from Schaffer which are included in this sub-section come from Schaffer (2015, section 2.2).

kinds: the “exogenous” variables are used to represent independent conditions of the system and the endogenous variables are used to represent the dependent conditions of the system. And as Schaffer puts it, such variables “come born situated in a space of incompatible values representing contrasts.” A “signature” for the variables is then stipulated, framed as $\mathbf{S} = \langle \mathbf{U}, \mathbf{V}, \mathbf{R} \rangle$ such that \mathbf{U} is a finite set of exogenous variables, \mathbf{V} is a finite set of endogenous variables, and \mathbf{R} is a function which maps every variable $X \in \mathbf{U} \cup \mathbf{V}$ to a set of values with a minimum of two members. As Schaffer illustrates with an example:

[I]f one is studying a rock being thrown through a window, one might work with the very simple signature $\mathbf{S1} = \langle \mathbf{U1} = \{Throw\}, \mathbf{V1} = \{Shatter\}, \mathbf{R1} \rangle$, where $\mathbf{R1}$ maps *Throw* to $\{0, 1\}$ (contrasting the rock’s being thrown with its being dropped to the ground) and maps *Shatter* to $\{0, 1\}$ (contrasting the window’s being shattered with its remaining intact).

Stage two: a “linkage” function (i.e. the “dynamics” of the system) is stipulated. The linkage is a function by which values are assigned to the endogenous variables relative to the values that exogenous variables might take. The linkage is framed as $\mathbf{L} = \langle \mathbf{S}, \mathbf{E} \rangle$ such that \mathbf{S} is a signature, \mathbf{E} is a set of structural equations and “[f]or every endogenous variable $V \in \mathbf{V}$, \mathbf{E} must include an equation $E \in \mathbf{E}$ such that E outputs a value v to V on the basis of values allotted to certain other variables, which thereby count as V ’s *parents*.”⁴² Continuing with the illustration of the window shattering and thus the signature $\mathbf{S1}$ above, Schaffer uses the specific linkage $\mathbf{L1} = \langle \mathbf{S1}, \mathbf{E1} \rangle$ “where $\mathbf{E1}$ is simply $\{Shatters \leftarrow Throw\}$ (outputting a 0 for *Shatter* given a 0 for *Throw*, and a 1 for *Shatter* given a 1 for *Throw*).”

Stage three: the actual states of the system represented are specified and an “assignment” function is stipulated by which exogenous variable are to be evaluated. The assignment is framed as

⁴² Additionally, a restriction is made on \mathbf{E} such that no variable can stand in the ancestral of the parenthood relation to itself (i.e. a “global acyclicity constraint”).

$M = \langle L, A \rangle$ “where L is a linkage as just characterized, and A is the smallest function mapping every exogenous variable $U \in U$ to exactly one value.” Finally then, the actual states of the system are specified, and thus one “says what actually happened” concerning the causal occurrence which is intended to be modelled. So for the illustrative case of the window shattering, let’s say it is specified that the rock was in fact thrown, in which case we get Schaffer’s assignment $M1 = \langle L1, A1 \rangle$ such that $A1$ is the smallest function assigning $Throw$ the value 1: $\{\langle Throw, 1 \rangle\}$. Thus having completed the three stage process and now putting together the representation of the system and the signature stipulated in stage one, the linkage stipulated in stage two, and the assignment stipulated in stage three, we get the following structural equation model for the causal influence between the throw of the rock and the window shattering:

$$S1 = \langle \{Throw\}, \{Shatter\}, R1 \rangle, \text{ where } R1 \text{ maps both } Throw \text{ and } Shatter \text{ to } \{0, 1\}.$$

$$L1 = \langle S1, \{Shatter \leftarrow Throw\} \rangle.$$

$$M1 = \langle L1, \{\langle Throw, 1 \rangle\} \rangle.$$

As mentioned above, this formalization can be used in an identical fashion to represent occurrences of grounding just as it can for occurrences of causation. Whereas in the case of causation this formalism serves to represent an influence between states of a system across time, in the case of grounding it represents states of a system across ontological levels. To illustrate, let’s take the example in which a spoon being made of metal grounds the spoon being electroconductive: an instance of a categorical property (the chemical structure of the spoon) grounding a dispositional property (the spoon’s disposition to conduct electricity). The idea here is that because the spoon’s chemical structure grounds *and thus is fundamental to or ontologically prior to* the spoon’s electroconductivity, the spoon’s chemical structure occupies a deeper ontological level than the spoon’s electroconductivity. Hence the point that modelling the counterfactual influence between

the spoon being metal and the spoon being disposed to conduct electricity is to model an influence that goes across ontological levels.

To now construct a structural equation model of this example of grounding, and thus show how this formalism can be used to model grounding in an identical fashion for modeling causation, let's carry out the same three-stage process described above. To carry out stage one and build a representation of the system under study, we need to discern what is to count as the independent and dependent conditions of the system and thus what is to be modelled as exogenous and endogenous variables respectively. In this example of grounding, the spoon's chemical structure is prior in the ordering of counterfactual influence and the spoon's electroconductivity is posterior in this ordering. Given this, the spoon being made of metal is to be treated as the independent conditions, notated as *Metal*, and the spoon being electroconductive is to be treated as the dependent conditions, noted as *Electroconductive*.

With the exogenous and endogenous variables having been stipulated, we then stipulate the signature to finish building the representation of the system under study. To stipulate the signature, we stipulate incompatible values which these variables can take, thus representing alternative possibilities of the conditions (i.e. the contrasts). Following exactly how Schaffer frames the window shattering example, let's take the value of 1 to correspond the metal being made of metal, which we'll model as $Metal = 1$, and let's take the value of 0 to correspond to the spoon *not* being made of metal (i.e. perhaps it was made of wood or clay, etc.), which we'll model as $Metal = 0$. Analogously, let's take the value of 1 to correspond the metal being electroconductive, which we'll model as $Electroconductive = 1$, and let's take the value of 0 to correspond to the spoon *not* being electroconductive, which we'll model as $Metal = 0$. So now we can stipulate a signature just as we did with the model in the case of causation: we stipulate a signature of the form $S = \langle U, V, R \rangle$ such that

U is a finite set of exogenous variables, V is a finite set of endogenous variables, and R is a function which maps every variable $X \in U \cup V$ to a set of values with a minimum of two members. A signature analogous to the signature from the causal model above would be: $S2 = \langle \{Metal\}, \{Electroconductive\}, R2 \rangle$ such that $R2$ maps both *Metal* and *Electroconductive* to $\{0, 1\}$.

Moving to the second stage, what is needed is a linkage of the form $L = \langle S, E \rangle$ such that S is the signature and E is a set of structural equations. Again, the linkage is a function by which a value is assigned to the endogenous variable given what the value is of the exogenous variable. A simple linkage for the example of the spoon could be $L2 = \langle S2, E2 \rangle$ such that $E2$ is $\{Electroconductive \leftarrow Metal\}$ and in which case: the linkage function would assign a value of 1 for *Metal* if *Electroconductive* were to have a value of 1, and in which the linkage would assign a value of 0 for *Metal* if *Electroconductive* were to have a value of 0.

Finally, to put the representation of the system and the linkage function to use, we enter the third stage. Thus what needs to be specified is “what actually happened” and thus whether or not the spoon is actually made of metal, and an “assignment” is stipulated by which the exogenous variables are to be evaluated. The assignment is framed as $M = \langle L, A \rangle$ such that L is a linkage and A “is the smallest function mapping every exogenous variable $U \in U$ to exactly one value,” as with the casual model. Then, we specify what the chemical structure of the spoon actually is to specify “what actually happened.” Let’s say that what actually happened was that in fact the spoon was made of metal. We can then stipulate the assignment as $M2 = \langle L2, A2 \rangle$ such that $A2$ is the smallest function mapping *Metal* to the value 1: $\{\langle Metal, 1 \rangle\}$. Having completed the three stage process of regimenting the example, we have a comprehensive structural equation model for the spoon being made of metal grounding the spoon being electroconductive as follows:

$$S2 = \langle \{Metal\}, \{Electroconductive\}, R2 \rangle \text{ such that } R2 \text{ maps } Metal \text{ and } Electroconductive \text{ to } \{0, 1\}.$$

$$L2 = \langle S2, \{Electroconductive \leftarrow Metal\} \rangle.$$
$$M2 = \langle L2, \{ \langle Metal, 1 \rangle \} \rangle.$$

Hence, this kind of formalism treats a grounding relation the very same way it treats a causal relation. Now, if one were convinced that the relations were fundamentally different, it would be reasonable for them to expect otherwise. Further, it would be reasonable to expect that such a precise and elaborate formalism which is used for regimenting causation would need to be *changed* in order to be used for regimenting grounding. But this kind of formalism requires no such change and it reflects no difference between the relations: as far as the formalism sees things, as we might say, the relations look like the very same thing. So again, even at a mathematically precise conceptual level by which dependence relations are represented via this kind of formalism, the likeness between the relations does not dissolve and is not shown to be tenuous or superficial. Instead, because the likeness between the relations is sustained even at the conceptual level of such a formalism, the likeness between the relations and is indeed reinforced and intensified.

With this being the last similarity between the relations that I'll discuss here, we thus have the following comprehensive list of similarities:

- Both are relations of production.
- Both are lawful relations.
- The relations share various formal features (such as irreflexivity, asymmetry and transitivity, etc.).
- Both relations impose metaphysical structure in the sense that they metaphysically order the contents of reality.
- Both relations are explanation-backing relations and thus both underlie reality's explanatory structure.

- Both relations correspond to counterfactuals.
- Both relations can be mathematically regimented by the same mathematical formalism, i.e. structural equation models, without a difference in how they are treated by this formalism.

Hence, the likeness between these relations is quite clear and quite strong. Given this profound likeness, a strong theoretical demand is thus raised to explore the question: given that the relations are profoundly similar, what exactly is it that makes them distinct? Further, given the profound similarity, could the view be plausible that causation and grounding are *not* distinct relations, and thus they are numerically identical relation kinds? I suggest that these questions have become urgent for the progression of the current conceptual framework surrounding the topic of grounding. For as rigorous and elaborate as this conceptual framework has become, and as widely recognized as it is that grounding is profoundly similar to causation, the relevant literature has yet to give this issue extensive focus.⁴³ Indeed, it is typical of the relevant literature that this issue is given astoundingly minimal attention or is overlooked entirely.

Before concluding this section, I will raise one last point: a point in favor of the usefulness of examining the connection between these relations. In the relevant literature, what is very often used as a basis for elucidating grounding is the way that grounding contrasts with various relations. For instance, it is quite common in the relevant literature to contrast it with the relations of *necessitation*, *reduction*, and *supervenience*.

Grounding may appear to be similar to necessitation if one thinks that grounding entities necessitate what they ground. Further, at first glance one might think that grounding just *is*

⁴³ A handful of notable exceptions—i.e. discussions which give notable attention to the issue—include, Bennett (Forthcoming), Koslicki (2016), Schaffer (2015), and A. Wilson (Forthcoming). Also noteworthy is Schnieder (2014)’s discussion of Bernard Bolzano’s views on the connection between grounding and causation.

necessitation. For if X grounds Y and X necessitates Y , perhaps it may appear that the metaphysical relation which backs a non-causal explanatory connection between X and Y is just the necessitation relation between them. However, necessitation fails to play needed role of backing a non-causal explanatory relation, which is demonstrated by the famous example that comes from Fine (1994) of Socrates and the singleton Socrates.

Since Socrates and the singleton Socrates do not come apart across possible worlds, the entities bear a necessitation relation. However, because this relation is symmetrical, for the modal connection goes from Socrates to his singleton *and vice versa*, such a modal relation fails capture a crucial metaphysical *asymmetry* between these entities. For Socrates would seem to be asymmetrically *prior* to the singleton. Thus grounding is invoked to do the job of capturing the asymmetry and the direction of determination and priority which necessitation fails to provide: the existence of Socrates grounds the existence of the singleton whereas the converse does not hold, and hence, a direction of determination priority goes from Socrates to the Singleton. In light of this consideration, grounding is often elucidated as the relation which contrasts with necessitation in the specific regard that grounding plays the role of fixing the asymmetry and the direction of determination and priority between entities which necessitation fails to fix.⁴⁴

A similar consideration is often focused upon in the relevant literature about the contrast between grounding and supervenience, such that: grounding fixes the asymmetry and the determinative priority between entities which supervenience fails to provide. This point is often explained by appeal to the example of physicalism about the mental. For a time, physicalism about the mental was commonly formulated in terms of supervenience, such that it was understood as the view that the mental supervenes on the physical. However, this supervenience-based formulation is

⁴⁴ For further discussion on this matter see deRosset (2013), Schaffer (2009) or J. Wilson (Forthcoming).

crucially problematic for it fails to capture any sort of asymmetry by which the physical is thought to determine or explain and thus bear a priority to the mental. Understanding physicalism in terms of grounding, such that the physical is thought to *ground* the mental, provides exactly these crucial aspects of the relationship between the physical and the mental which supervenience fails to provide: given the idea that the physical grounds the mental, the physical can be said to bear a determinative and explanatory relation to the mental.⁴⁵ In light of this consideration, grounding is often elucidated as the relation which contrasts with supervenience in the respect that grounding plays this role for formulating views which characterize entities in terms of explanatory priority.

Grounding also contrasts with reduction in the same way, such that grounding plays the theoretical role that reduction fails to play, though the contrast between grounding and reduction is a bit more complex than the contrast between grounding and necessitation or supervenience. Reduction used to be the relation commonly appealed to in order to make sense of the conception on which the world bears a levelled structure. This rough conception is thus the same conception of reality suggested by the hierarchy-based treatment of grounding discussed above: the conception of reality such that reality has a hierarchal structure, and what holds at a given level holds in virtue of what holds at lower levels. In order to make sense of this conception, what is needed is some account of the relation that plays the role connecting higher level entities to lower level entities.

Necessitation and supervenience fail to play this role, for the reason explained above: they fail to provide the needed asymmetry and the needed determinative priority. Reduction on the other hand might appear to fulfill the needed role because reduction is asymmetric: if facts about mental states reduce to facts about brain states, for instance, facts about physical states do not reduce to facts about brain states. But the problem is that higher level facts can be determined and explained

⁴⁵ For further discussion of the role of grounding in formulating physicalism, see Bliss and Trogon (2016, section 6.1).

by lower level facts without reducing to these lower level facts. For instance, given that mental states are multiply realizable, facts about mental states can obtain in virtue of facts about things other than brains. So, there are facts about mental states which obtain in virtue of facts about brain states despite it being the case that the former facts do not reduce to the latter facts.

To raise another example which does not rely on the controversial claim that mental states are multiply realizable, let's consider an example suggested by deRosset (2013, 6). Say that Al is 5'4" and Beth's height is 5'8", and so their average height is 5'6". Notice that their average height is determined by and explainable in terms of the facts about their actual heights but despite this, their average height does not reduce to the facts about their actual heights. For their average height could obtain in virtue of different facts: if Al was 5'2" and Beth was 5'10", the fact would obtain that their average is 5'6". So examples of this kind demonstrate that reduction fails to connect higher level and lower level facts in the needed way. Grounding is invoked to play that needed role: higher level facts are determined by and explained by lower level facts in the sense that they are grounded by them (hence, the point of the hierarchy-based treatment of grounding). In light of this consideration, grounding is often elucidated as the relation which contrasts with reduction in the regard that grounding plays this role of connecting higher level facts to lower level in terms of a determinative and explanatory connection which is compatible with multiple realization.⁴⁶

This brings us to the point that the way that grounding is often understood is in terms of how it compares and contrasts with other relations. So because the comparison between grounding and causation has yet to be the subject of intense focus, and because these relations so closely

⁴⁶ For further discussion of the comparison and contrast between grounding and reduction, see Correia and Schnieder (2012), deRosset (2013), Tahko and Lowe (2015, chapter 5) or Trogdon (2013a).

resemble one another, we have all the more reason to explore the comparison and indeed to ask exactly what makes these relations distinct.

1.7. Taxonomy of the Views to be Compared

The purpose of the discussion in the following chapters is to compare several views which are concerned with the connection between causation and grounding. These views are outlined in this section and further elaboration of these views is offered in chapter 2.

The view on which grounding and causation are numerically distinct relations I will call “grounding-causation-non-identity” or “*GCN*” for short. *GCN* comes in two varieties: a strict and a moderate variety. On “strict-*GCN*,” there is no connection between causation and grounding: the very nature of each relation is entirely distinct. Framed it in terms of an analogy, in the same respect that the relation of temporal distance is entirely independent of the *is-as-brightly-colored-as* relation, causation and grounding are entirely independent. As an advocate of this view might say, the resemblance between causation and grounding is a *nominal* resemblance.

“Moderate-*GCN*,” as the name implies, is the less-extreme variety of *GCN*. On moderate-*GCN*, although causation and grounding are numerically distinct, there *is* a tight connection between them. Just as *GCN* comes in two varieties, moderate-*GCN* also comes in two varieties. The two varieties of moderate-*GCN* are distinguished by how they understand the connection between causation and grounding. What I will call “common-genus-*GCN*” is the variety of moderate-*GCN* on which the relations are tightly connected in the following respect: they are each species of the

same genus. This is the standard view concerning the connection between causation and grounding; explicitly endorsed by some and implicitly endorsed by others.⁴⁷

Since Schaffer (2015) offers the most explicit endorsement and the most extensive defense of common-genus-*GCN* that I am aware of, I will take this to be a paradigmatic representation of this view. As Schaffer (2015) frames common-genus-*GCN*, the common genus of causation and grounding is *dependence*, meaning: causation and grounding are distinct species of dependence. And as Schaffer frames the view, each relation is understood in terms of a distinct primitive notion: a primitive notion of causation and a primitive notion of grounding.

On the alternative variety of moderate-*GCN*, although causation and grounding are numerically distinct, they are tightly connected in the respect that one of these relations is a species of the other: either grounding is a species of causation or causation is a species of grounding. So, one of the relations *subsumes* the other in the way that a genus subsumes its species. Hence, I will call this version of moderate-*GCN* “subsumption-*GCN*.” Though this view is quite rarely adopted, an explicit endorsement and systematic defense of it is provided by A. Wilson (Forthcoming). Thus I will take A. Wilson (Forthcoming) to be a paradigmatic representation of this view. A. Wilson’s preferred way of framing subsumption-*GCN* is such that grounding is treated as a species of causation, rather than the other way around.⁴⁸ In his terminology, grounding is a “special case” of causation: grounding is “metaphysical causation.”⁴⁹ And as A. Wilson frames subsumption-*GCN*,

⁴⁷ Some discussions of grounding which seem to implicitly endorse this view include: deRosset (2013), Fine (2012), Trogdon (Forthcoming), Rosen (2010), and von Solodkoff (2011).

⁴⁸ Bennett (Forthcoming) can be read as endorsing the version of subsumption-*GCN* on which causation is a species of grounding. Though, as Bennett points out (p.16-17), this reading requires that “grounding” is understood in a broad sense such that grounding’s *relata* is not restricted to facts. Grounding understood in this broad sense is what she calls “building,” the relation by which any kind of a thing arises out of others.

⁴⁹ Bolzano (1837) proposed a view that is amenable to being interpreted this way. See Schnieder (2014) or Tatzel (2002) for focused discussion of Bolzano’s relevant views.

both relations are understood in terms in the same primitive notion: the notion of causation. So, metaphysical causation (i.e. grounding) and non-metaphysical causation (i.e. what is standardly just called “causation”) are understood as distinct kinds of cases in which the notion of causation is satisfied.⁵⁰

In critical response to *GCN*, I explore an alternative view which I will call “grounding-causation-identity” or “*GCI*” for short. *GCI* is the view that the distinction between the relations is a *false* distinction. So as the name implies, it is the view that causation and grounding are identical *strictly speaking*: causation and grounding are *numerically identical* relations. Since the view treats them as the same relation, *GCI* employs a single primitive notion of dependence. And so, the view frames causation and grounding in terms of the same primitive notion (like A. Wilson’s version of subsumption-*GCN* and unlike common-genus-*GCN*).⁵¹

The basic sense of *identity* by which I intend to frame *GCI* is the basic, standard sense of identity provided by Leibniz’s law. Thus, in this basic sense of identity *GCI* treats causation and grounding numerically identical relations. Framing the identity or non-identity between the relations in this way is not out of the ordinary. To the contrary, framing the identity or non-identity between the relations this way is to adopt a line of thought also employed by both Schaffer (2015)’s discussion of common-genus-*GCN* and A. Wilson (Forthcoming)’s discussion of subsumption-*GCN*. To elaborate, Schaffer’s attribution of non-identity between causation and grounding is based upon there being differences in features between the relations. As he proposes, grounding is superinternal, necessarily well-founded, and necessarily deterministic.⁵² In contrast, causation bears

⁵⁰ This presentation of A. Wilson’s view is intentionally simplified. Nuances of the view which are not crucial here are addressed in chapter 2.

⁵¹ More to be said about this in chapter 2.

⁵² These purported differences between the relations are focused upon in later chapters.

none of these features. Thus, by appeal to the fact that the relations do not share these features, Schaffer concludes that the relations are distinct. Since this rationale for treating the relations as distinct would not work unless Schaffer assumed a basic Leibniz's-law-criterion of identity, Schaffer's view thus implicitly adopts this criterion. Likewise, A. Wilson (Forthcoming) distinguishes between grounding and causation—or in his terms, causation in the metaphysical case and causation in the non-metaphysical case—by appeal to the following difference: the former holds as a matter of metaphysical law, whereas the latter holds as a matter of nomological law.⁵³ So, again, since this rationale for treating the relations as distinct would not work unless a basic Leibniz's-law-criterion of identity is assumed, A. Wilson's view implicitly adopts this criterion.

Thus, both Schaffer and A. Wilson attribute non-identity between causation and grounding by appeal to a basic Leibniz's-law-criterion of identity. Adopting the same line of thought, the identity which *GCI* attributes to the relations is cashed out in terms of sameness of features, and thus the same basic Leibniz's-law-criterion of identity.⁵⁴

To further elaborate *GCI*, one way of explaining this view is by calling attention to a common way of thinking about other relations and explaining how this way of thinking would apply if it were used for thinking about dependence. For instance, let us consider how supervenience is typically understood. Although tokens of supervenience bear many differences, supervenience is *not* thought to come in distinct *kinds* or *species*. Thus, although supervenience is manifested in different ways, these are distinct manifestations of the same unvariegated phenomenon. To illustrate, some tokens of supervenience obtain at the macroscopic level, whereas others obtain at the microscopic level. Likewise, some tokens of supervenience hold between biological entities, whereas others hold

⁵³ This purported difference between the relations is focused upon in chapter 3.

⁵⁴ Indeed, this entails that defending *GCI* will hinge upon the argument that the purported differences between the relations do not hold. The purpose of chapters 3 and 4 is to present that argument.

between non-biological entities. Further, some tokens of supervenience differ with respect their temporal location, their modal strength, etc. But although tokens of supervenience bear these differences, it is not thought that these differences are reflective of divisions which hold between variegated *kinds* of supervenience.

Thus, it is not thought that there is some specific kind of supervenience which obtains at the macroscopic level and another kind which obtains at the microscopic level. Likewise, it is not thought that there is some specific kind of supervenience which holds between biological entities and another kind which holds between non-biological entities. Further, it is not thought that there are variegated kinds of supervenience which are distinguished by differences in the temporal location of supervenience-relation-tokens or the modal strength of supervenience-relation-tokens, and so on. So, to put it simply, it is typically thought that supervenience is *just* supervenience in all instances, regardless of how it obtains. So in this way, the many instances of supervenience are strongly *unified*.

Now, if we apply this same way of thinking to dependence, this provides the conception of dependence which *GCI* proposes. On *GCI*, indeed, tokens of dependence bear many differences, such as difference with respect to their temporal location, their relata, their modal strength, and so on. But although tokens of dependence bear these differences, these differences are not reflective of divisions which hold between variegated *kinds* of dependence. Thus, it is not the case that there is some specific kind of dependence which obtains at some temporal location and another kind which obtains at another temporal location. Likewise, it is not the case that there is some specific kind of dependence which obtains with a specific modal strength and another kind which obtains with another modal strength. And so on, for all differences. On *GCI*, tokens of dependence are tokens of a single phenomenon which does not admit of variegated kinds or species. So, like one might think

that supervenience is *just* supervenience in all instances, regardless of how it obtains, *GCI* suggests that dependence is *just* dependence in all instances, regardless of how it obtains: although dependence is manifested in many ways, these are distinct manifestations are of the same unvariegated phenomenon. In this sense, dependence relations are treated by *GCI* as strongly *unified*.

At risk of belaboring the point, the analogy might be more illustrative and compelling if it as framed as analogy between *identity* and dependence, rather than *supervenience* and dependence. For it is extremely intuitive that identity does not admit of variegated kinds, although tokens of identity bear many differences: differences in relata, spatiotemporal location, etc. Thus, just as the distinct manifestations of identity are manifestations of the same unvariegated phenomenon, the distinct manifestations of dependence are manifestations of the same unvariegated phenomenon.⁵⁵

Another helpful point about how I envision *GCI* is as follows. The words “causation” and “grounding” are used within philosophical discourse to refer to dependence as it obtains under distinct conditions. And it is thought that this word-usage reflects or corresponds to an ontological division between distinct kinds of dependence (as common-genus-*GCN* suggests). *GCI* denies this: since there are no distinct kinds of dependence relations, it is false that this word-usage reflects or corresponds to any such ontological division. To again employ an analogy between identity and dependence, imagine that words *W* and *W** are each used to refer to identity as it obtains under distinct conditions. If identity does not come in distinct kinds, then this way of using words *W* and *W** does not reflect or correspond to any ontological division between kinds of identity. *GCI* suggests that the same holds for the words “grounding” and “causation.” That is, these words are

⁵⁵ Said a bit more carefully, the point as follows. Just as identity obtains in non-uniform ways, though identity is *just* identity in all cases, *GCI* proposes that the same holds for dependence: though dependence obtains in non-uniform ways, dependence is *just* dependence in all cases.

used to refer to dependence as it obtains under different conditions, but this is a mere convention of word-usage. This word usage fails to reflect how dependence works *ontologically*.

Now, let us call the “*connection question*” the following question: are causation and grounding connected, and if so, *how*? The taxonomy of views just discussed can be summarized in terms of what each view would suggest is the correct response to the connection question. Strict-*GCN* suggests that correct response is simply *no*: causation and grounding are *not* connected (and thus no account ought to be provided for *how* they are connected). Common-genus-*GCN* suggests that the correct response to the connection question is as follows. Firstly, *yes*: causation and grounding *are* connected. Secondly, the connection between them is the connection which holds between two species of a common genus. As subsumption-*GCN* would suggest, *yes*: causation and grounding *are* connected. Secondly, the connection between them is the connection which holds between a genus and a species that falls under that genus. Lastly, *GCI* suggests that the correct response to the connection question is *yes*: the relations *are* connected. Further, the connection between them is a connection of *identity*.

The intended goals of the discussion below are as follows. Strict-*GCN*, I will argue, is the least plausible view in question. So *GCI* and moderate-*GCN* are both more plausible than strict-*GCN*. Concerning the comparison between *GCI* and moderate-*GCN*, I will argue that *GCI* is *at least as plausible* as moderate-*GCN*. Thus, the central goal of the discussion is to establish that *GCI* is to be taken *just as seriously* as moderate-*GCN*. For upon close inspection, it turns out that *GCI* can be defended just as cogently and elaborately. And so, the standard assumption that moderate-*GCN* is the only view on the matter worth taking seriously is an *unwarranted* assumption.

Finally, we come to one of the implications of *GCI* which motivates my exploration of this view. *GCI* and *GCN* imply different conceptions concerning ontological structure. Since *GCN* holds

that causation is distinct from grounding, this view implies the following conception of ontological structure. The kind of ontological structure imposed by causation, or “*built*” from causal relations, is distinct from the kind of ontological structure imposed by grounding, or “*built*” from grounding relations. Thus, reality’s causal structure is distinct from reality’s hierarchal structure. In this sense, if *GCN* is true, then ontological structure is *disunified*. In contrast, if *GCI* is true, and thus the distinction between causation and grounding is a false distinction, then the distinction between causal structure and hierarchical structure is also a false distinction. In this sense, *GCI* implies that ontological structure is *unified*: ontological structure is built from a single kind of relation, and so ontological structure is of one kind.

I will avoid an unnecessary digression about why one might *care* if ontological structure is unified or disunified. I simply point out that *if* one finds this implication enticing, one would have an interest in exploring *GCI* that extends beyond interest in just causation and grounding. Hence, since I find this implication substantially enticing, this implication plays a significant role in motivating the exploration of *GCI* to follow. For indeed, as it was said in the introduction, *unity is enchanting*.

2

Four Points of Comparison

2.1. Introduction to the Argumentative Stage of the Discussion

In the discussion to follow, I compare the views in question by appeal to five main points of comparison. Thus, I present five central arguments in the discussion. And for each of these arguments, I defend a claim concerning which view is most plausible, or which views are more plausible, with respect to one of these points of comparison. These points of comparison are:

- How well the views explain the likeness between causation and grounding.
- How conceptually parsimonious the views are.
- How well suited the views are to the connection between causal explanation and metaphysical explanation.
- The ability of the views to provide an account of an anomalous dependence relation which crosses both time and ontological levels.
- The extent to which the views are supported or undermined by disputes about the purported differences between causation and grounding.

Each main argument in the discussion presents a conclusion about how the views in question compare with respect to one of these points of comparison. The first four points of comparison listed above are discussed here in chapter 2, and the fifth point of comparison is discussed throughout chapters 3 and 4.

2.2. The Argument from Likeness

In the previous chapter, I had discussed the following similarities between causation and grounding:

- Both are relations of production.
- Both are lawful relations.
- The relations share various formal features (such as irreflexivity, asymmetry and transitivity, etc.).
- Both relations impose metaphysical structure in the sense that they metaphysically order the contents of reality.
- Back relations are explanation-backing relations and thus both underlie reality's explanatory structure.
- Both relations correspond to counterfactuals.
- Both relations can be mathematically regimented by the same mathematical formalism, i.e. structural equation models, without a difference in how they are treated by this formalism.

These similarities were discussed in the previous chapter for the purpose of using them as a basis of motivating this discussion. As it was explained, showing how strong the likeness is between causation and grounding shows how unclear the distinction between the relations might appear to be. And this makes it worth exploring how the distinction is to be understood—or if it even holds. I now draw attention to these similarities once again, but for a different purpose. Here, I draw attention to the similarities to use them as the basis of *the argument from likeness*. This argument is intended to establish two conclusions, the first of which is this: among the views about the

connection between causation and grounding, strict-*GCN* is the least plausible and thus, it is to be rejected.

The rationale by which I draw this first conclusion is as follows. Strict-*GCN* cannot explain the systematic and remarkable similarities between causation and grounding. So on this view, the similarities are inexplicable and coincidental. In contrast to strict-*GCN*, the other views in question all avoid the idea that the similarities are inexplicable and coincidental. For although the other views in question all envision the connection between causation and grounding differently, each of these holds that there is some connection between the relations which explains *why* there are such systematic and remarkable similarities between them.

If one adopts common-genus-*GCN*, one can explain the similarity between the relation very simply by appeal to the fact that the relations are species of the same genus. For it is quite plausible that if some *X* and some *Y* are species of the same genus, then they would indeed bear systematic and remarkable similarities. Likewise, if one adopts subsumption-*GCN*, one can explain the similarities between the relations just as simply, by appeal to the fact that one of the relations is a species of the other. For it is quite plausible that if *X* is a species of *Y* or vice versa, then they would indeed bear systematic and remarkable similarities. Finally, if one adopts *GCI*, one can explain the similarity between the relations just as simply, by appeal to the fact that the relations are one and the same thing. For it is quite plausible that if *X* and *Y* are numerically identical, then they would indeed bear systematic and remarkable similarities (in fact, this could even be considered a *tautological truth*).

So strict-*GCN* must treat the similarities as inexplicable and coincidental whereas the other views avoid treating the similarities this way, since the other views can explain the similarities. I thus propose that strict-*GCN* is to be rejected since it offers the least plausible treatment of the likeness of causation and grounding.

This rationale relies on the crucial premise that it is more plausible to treat the similarities between the relations as explicable rather than inexplicable. Call this the “explicability premise.” To bolster the argument, I will elucidate the plausibility of this premise. And to do so, I will point out that assuming this premise leads to a reasonable way of thinking in a slightly different context of thought: assuming this premise leads to reasonable way of thinking about causation *and causation only*. Thus, to elucidate the plausibility of the explicability premise, I will focus on a context of thought that is focused on causation only, instead of the context of thought in which causation *and grounding* are the focus.

Let’s ask: how might one discern whether some relation R is or is not a causal relation? One way of approaching this is to first identify some of the features which causal relations have in common due to their common nature. If one identified such features, one would have a basis for concluding whether R is or is not causal. If it turns out that R has these features, it can be concluded that R is indeed a causal relation. If it turns out that R does *not*, it could then be concluded that R is not causal.

Among the similarities which causal relations bear due to their common nature are the following similarities. Causal relations are commonly law-governed, explanation-backing, irreflexive, asymmetric, transitive and order-imposing. Further, causal relations are commonly relations of *dependence*, they commonly correspond to counterfactuals and they are commonly amenable to the very same sorts of formal regimentations (like structural equation models, for instance). If it were revealed that R does indeed have these features just mentioned, it would be reasonable to conclude that R *is* a causal relation.

So, the point is this. The rationale used for establishing that this conclusion rests on the idea that causal relations bear these specific similarities *for a reason which explains the similarities*. That is, this

rationale relied on the idea that causal relations bear these similarities because they are connected in a way that *explains* them bearing these similarities. Now, notice that these specific similarities *are among the similarities which hold between causation and grounding*. Analogously, just as these similarities in question can be reasonably thought to hold between casual relations *for a reason which explains why these similarities hold*, these same similarities can be reasonably thought to hold between causation and grounding *for a reason which explains why these similarities hold*. Hence the explicability premise: the similarities between causation grounding are more plausibly treated as holding *for a reason*. Thus they are more plausibly treated as explicable rather than inexplicable.

So, reiterating the argument against strict-*GCN*: strict-*GCN* treats the likeness between the relations as inexplicable whereas the other views in question do not, for these other views each posit some connection between causation and grounding which explains the likeness. Therefore, I reject strict-*GCN*. Having rejected it, henceforth, strict-*GCN* will be left out of the discussion.

I now turn attention to the second conclusion which I base upon the point of comparison at hand; i.e. the likeness between causation and grounding. The second conclusion is this: with respect to this point of comparison, *GCI* is just as plausible as moderate-*GCN*. This is because, as I suggest, *GCI* offers just as plausible of an explanation of the likeness as the explanations offered by both version of moderate-*GCN*.

To elaborate, let's consider again how these views explain the likeness. Again, common-genus-*GCN* offers a perfectly cogent way of accounting for why there are systematic similarities between causation and grounding. This is because it seems like a true generalization that if *X* and *Y* are both species of the same genus, then *X* and *Y* will bear systematic similarities by virtue of *X* and *Y* being connected in that way. Likewise, subsumption-*GCN* offers a perfectly cogent way of accounting for why there are systematic similarities between causation and grounding. This is

because it seems like a true generalization that if X is a species of Y , then X and Y will bear systematic similarities by virtue of X and Y being connected in that way. And as I suggest, the similarities are just as plausibly explained by GCI . For if this view holds, and thus the relations are one and the same, then there certainly is a generalization which offers a way of accounting for the similarities: if X is numerically identical to Y , then X and Y will bear systematic similarities by virtue of X and Y being connected in that way. Hence the second conclusion I base upon the likeness between causation and grounding: GCI , common-genus- GCN and subsumption- GCN are equally plausible with respect to the point of comparison concerning the likeness. In this respect, GCI is to be taken just as seriously as moderate- GCN .

2.3. The Argument from Parsimony

Again, subsumption- GCN is the view on which either causation is a species of grounding (and thus grounding *subsumes* causation) or grounding is a species of causation (and thus grounding is *subsumed* by causation). A. Wilson (Forthcoming) argues against common-genus- GCN and in favor of subsumption- GCN by appeal to considerations about conceptual parsimony; i.e. a theories parsimony of primitive notions. Below, I adopt his style of argument and use it to compare moderate- GCN with GCI . Thus the second point of comparison to be discussed is conceptual parsimony, and this is focus of *the argument from parsimony*.

To set up discussion of this argument, it will be helpful to first elaborate how A. Wilson employs the argument and the version of subsumption- GCN which he uses it to defend. A. Wilson opts for the variety of subsumption- GCN on which grounding is a species of causation, or as he puts it, a “special case” of causation. To account for the distinction between the relations, he suggests that ordinary or *non-special* causal relations are those which hold as a matter of nomological

law, and grounding relations are causal relations which hold as a matter of metaphysical law.⁵⁶ Thus, ordinary or non-special causation is “nomological causation” and grounding is “metaphysical causation.”

A. Wilson (Forthcoming) compares his view with common-genus-*GCN* in terms of conceptual parsimony, and he proposes the comparison favors his view. For his view relies on fewer primitive notions. As he puts it:

If grounding is just metaphysical causation, then we do not need a separate theory of grounding invoking new primitive notions. Instead, our theory of grounding will invoke only whatever fundamental ideology is employed by our best theory of causation in general, in addition to the notion of a law of nature. (3)

To elaborate, A. Wilson’s view does not require the notion of laws plus *two* primitive notions: one for grounding and one for causation. Since he treats grounding as a special case of causation which is distinguished by its corresponding metaphysical laws, his notion of grounding is defined in terms of the notion of causation plus the notion of laws: grounding = causation + metaphysical laws, to put it very roughly. In contrast, common-genus-*GCN* is not quite as conceptually parsimonious. Like A. Wilson’s view, common-genus-*GCN* also employs the notion of laws. For as common-genus-*GCN* is typically framed, this view explicitly holds that grounding and causation are lawful relations in the sense that they hold in virtue of laws, like A. Wilson’s view holds.⁵⁷ But unlike A. Wilson’s view, common-genus-*GCN* does not define either the notion of causation or the notion of grounding, for it treats both notions as *primitive*. Thus, common-genus-*GCN* relies on *more* primitive

⁵⁶ A. Wilson uses the phrase “metaphysical principles” rather than metaphysical laws. Nonetheless, the crucial point about how he distinguishes nomological causation from metaphysical causation is not distorted by presenting this distinction in terms of nomological laws and metaphysical laws (which he takes to correspond to nomological causal relations and metaphysical causal relations respectively).

⁵⁷ Indeed, the discussion’s representative account of common-genus-*GCN*—Schaffer (2015)—explicitly holds that grounding is a lawful relation. For as Schaffer suggests (section 1.4), if *X* grounds *Y*s, then this is an instance of a generalization that is “backed by underlying formative principles” where “formative principles” are “the laws of metaphysics (the most general principles of grounding).”

notions. So as A. Wilson proposes, the theoretical virtue of conceptual parsimony favors his view over common-genus-*GCN*.

To adopt this style of argument for the purposes of the discussion here, I will thus adopt the point of comparison between views which this argument draws attention to: conceptual parsimony. As A. Wilson employs this point of comparison, he compares subsumption-*GCN* (as he frames the view) and common-genus-*GCN* only: he is silent about *GCI* (perhaps because he overlooks the seriousness of the view). So I will employ the relevant point of comparison with a wider scope: I will use it to compare all three of the views in question, thus comparing subsumption-*GCN*, common-genus-*GCN* and *GCI*. As I will argue, although this point of comparison favors subsumption-*GCN* and *GCI* over common-genus-*GCN*, this point of comparison favors *GCI* and subsumption-*GCN* *equally*. And thus, the point remains that *GCI* is to be taken no less seriously than moderate-*GCN*.

To simplify the presentation of the argument, I will focus my comments about subsumption-*GCN* on just A. Wilson's version of the view: the version on which grounding is a species of causation rather than vice versa. I will denote his version of the view as "subsumption-*GCN-W*" (with the added "*W*" standing for *Wilson*). This will not affect the argument. The relevant claims to be made about subsumption-*GCN-W* apply to both versions of subsumption-*GCN*, assuming the following: on both versions of the view, the notion of the species-level relation is defined in terms of the notion of the genus-level relation.⁵⁸

⁵⁸ Perhaps one *could* frame subsumption-*GCN* without defining one of the relevant notions in terms of the other. But this breed of subsumption-*GCN* would only be as parsimonious as common-genus-*GCN*. So the relevant considerations about parsimony which speak against common-genus-*GCN* would then also speak against this breed of subsumption-*GCN*. Either way, the argument goes through. This is because, to make the point explicit, the argument establishes the following. Firstly, *GCI* is more parsimonious than common-genus-*GCN*. Secondly, *GCI* is just as parsimonious as the version of subsumption-*GCN* which relies on fewer primitive notions, and thus which is the more parsimonious version of the two (i.e. the version on which the notion of the species-level relation is defined in terms of the notion of the genus-level relation).

As explained above, A. Wilson argues that subsumption-*GCN-W* employs fewer primitive notions than common-genus-*GCN*. This is because the notion of grounding reduces to the notion of causation on subsumption-*GCN-W*, whereas common-genus-*GCN* employs a primitive notion of causation *plus* a primitive notion of grounding. Hence, A. Wilson concludes that subsumption-*GCN-W* is more conceptually parsimonious. The comparison between *GCI* and common-genus-*GCN* works the very same way, I suggest. Whereas common-genus-*GCN* employs distinct primitive notions of causation and grounding, *GCI* employs one primitive notion to account for both relations, since *GCI* identifies grounding and causation. Quite simply then, *GCI* is more conceptually parsimonious than common-genus-*GCN* in the same way subsumption-*GCN-W* is.

The comparison between *GCI* and subsumption-*GCN-W* is also quite simple. But to explain this comparison, what needs to be mentioned is that *GCI*, as I envision it, is in agreement with the rival views in the following respect. Like the rival views, *GCI* holds that grounding relations are *lawful* relations. Thus, on *GCI*, if it is the case that *X* grounds *Y*, this is the case in virtue of some law. Or more simply, this being the case is an instance of some lawful generalization.⁵⁹ Since *GCI* holds that grounding relations are lawful, *GCI* entertains a primitive *notion* of laws. Now, with this in mind, *GCI* and subsumption-*GCN-W* can be compared in terms of conceptual parsimony.

Very simply, *GCI* and subsumption-*GCN-W* are just as parsimonious as one another. Both views employ a primitive notion of laws, and both views understand causation and grounding in terms of one primitive notion. For once again, subsumption-*GCN-W* frames grounding by appeal to the notion of metaphysical causation, which reduces to the broader notion of causation. And because *GCI* identifies causation and grounding, this view requires only a single primitive notion by which it frames causation and grounding. Therefore, *GCI* and subsumption-*GCN-W* fare just as well

⁵⁹ My reasons for thinking that grounding must be a lawful relation are complex. Since those issues do not affect the matters discussed here, I leave those issues aside.

as one another with respect to the theoretical virtue of conceptual parsimony. The point is thus maintained that *GCI* is to be taken no less seriously than its rival views.

2.4. The Argument from Explanation

The third point of comparison I will discuss concerns the kinds of explanations which causation and grounding are thought to correspond to, or as it's said, "*back*." And the argument which I use this point of comparison as a basis for is an argument that is intended to favor *GCI* over all varieties of *GCN*. So, my comments about *GCN* in this section will be directed at *GCN* in general rather than just moderate-*GCN*.

Whereas causation is thought to correspond to / back causal explanation, grounding is thought to correspond to / back metaphysical explanation. The relationship between causation and causal explanation is familiar: if event *C* causes event *E*, then the fact or proposition that *C* occurs causally explains the fact or proposition that *E* occurs. This is analogous to the relationship between grounding and metaphysical explanation: if *X* grounds *Y*, then the fact or proposition that *X* obtains *metaphysically* explains the fact or proposition that *Y* obtains (more about this below).

If the distinction between causal explanation and metaphysical explanation holds, this speaks in favor of *GCN* and against *GCI*. For *GCN* is better suited to there being a distinction between these kinds of explanation. This is because if one adopts *GCN*, then one can treat the distinction between causal and metaphysical explanation such that it *reflects* the distinction between causation and grounding. And in this case, if one adopts *GCI*, then one must treat causal explanation and metaphysical explanation in such a way that they fail to reflect the identity of causation and grounding. Conversely, if the distinction between causal explanation and metaphysical explanation does not hold, this speaks in favor of *GCI* and against *GCN*. For *GCI* is better suited to there being

no distinction between these kinds of explanation. This is because if one adopts *GCI*, then one can treat the lack of distinction between causal and metaphysical explanation in such a way that it *reflects* the lack of distinction between causation and grounding (i.e. it reflects the *identity* between causation and grounding). And in this case, if one adopts *GCN*, then one must treat causal explanation and metaphysical explanation such that they fail to reflect the distinction between causation and grounding.

As I will argue, the distinction between causal and metaphysical explanation does not hold. Thus, *GCI* is better than *GCN* with respect to how well suited these views are to the connection between causal explanation and metaphysical explanation. This is the “argument from explanation” in favor of *GCI*.

To make this argument, the distinction between causal and metaphysical explanation must be sketched. One of the clearest statements of this distinction comes from Dasgupta (2014), in which he says:

[T]o say that some facts ground another is just to say that the former explain the latter, in a particular sense of “explain.” To illustrate, imagine that you are sitting at a desk and someone asks why the desk is there. One way to answer the question would be to offer a causal explanation: for example, that someone carried the desk into the room a few days earlier. But another answer would be to say that there is a desk there because some bits of wood are arranged in a way that is conducive to supporting laptops and cups of coffee and so on. In giving this second explanation one is not concerned with what caused the desk to be there; rather, one is trying to say what it is about the room in virtue of which it counts as containing a desk in the first place. Someone in search of this second explanation recognizes that desks are not basic entities, so that if there is a desk in the room, there must be some facts about the room that are responsible for the existence of a desk, that is, that make it the case that the room contains a desk . . . I refer to this as a grounding explanation, or a statement of what grounds the fact that there is a desk there. (558)

To carefully elaborate this, let’s call a fact’s “*target-entities*” the entities which the given fact is a fact *about*. Dasgupta suggests that for one to metaphysically explain a fact *F*, one must perform the following explanatory tasks. Firstly, one must provide information about the *nature* of an entity *e* that

is among F 's target-entities: one must specify what the required conditions are which the obtaining of e depends upon due to e 's nature. Secondly, one must provide information to the effect that the conditions which the obtaining of e depends upon are satisfied. Hence, if the fact F to be metaphysically explained is the fact that there is a desk in the room, the following must be accomplished. Firstly, since F 's relevant target-entity e is a desk, it must be specified what the obtaining of a desk depends upon to a desk's nature: it must be specified that the nature of a desk requires that if the room contains a desk, then the room must contain some objects arranged desk-wise. Secondly, it must be specified that the conditions are satisfied which are required for the obtaining of there being a desk: it must be specified that the room contains objects arranged desk-wise. Thus, Dasgupta's account suggests that metaphysically explaining a fact F is to specify what the conditions are that F depends upon due to the nature of one of F 's target-entities, and specifying that these conditions are satisfied. That is what distinguishes a causal explanation from an explanation that is backed by a grounding relation: metaphysical explanations accomplish these explanatory tasks whereas causal explanations do not.

I will base my discussion below on this way of understanding the distinction between causal and metaphysical explanation. Firstly, this is because this account is one of the clearest that I am aware of. Secondly, this is because this account of metaphysical explanation works very well for portraying many cases in which an explanation is backed by a grounding relation. For instance, let's consider the *JTB* account of knowledge (i.e. the justified-true-belief account). To set up the example to illustrate the needed point, let's assume that the nature of knowledge is such that, if an agent possesses *JTB* that P , then the agent has knowledge that P . That is, due to nature of knowledge, *JTB* grounds knowledge. So then, applying Dasgupta's sketch of metaphysical explanation, a metaphysical explanation of some instance of knowledge will work as follows. Say we are metaphysically explaining the fact, F^* , that my nephew Harrison has knowledge. In this case, the

relevant target-entity is a knowledge-state. Thus, to metaphysically explain why F^* holds, it must be specified that the nature of knowledge requires that if an agent possesses a knowledge-state, then the agent must possess *JTB*. Secondly, it must be specified that the conditions are satisfied which the obtaining of knowledge requires: it must be specified that Harrison possesses *JTB*. Thus, one metaphysically explains F^* by stating that it is in the nature of knowledge that knowledge depends upon *JTB*, and stating that Harrison possesses *JTB*.

Now, to deny the distinction between causal and metaphysical explanation, I will raise counterexamples to Dasgupta's characterization of metaphysical explanation. The first counterexample is of the following sort: it is a case in which a causal explanation satisfies Dasgupta's characterization. Since it satisfies this characterization, this causal explanation qualifies as a metaphysical explanation. Thus, causal explanation is no different than metaphysical explanation in this case, and so the distinction between causal and metaphysical explanation fails.

The basis for understanding this counterexample is a view called "dispositional essentialism," henceforth "*DE*." *DE* is a view which derives from Shoemaker (1980)'s treatment of properties, and this view has been expanded by recent accounts, such the accounts offered in Ellis (2001, 2002). The core idea of Ellis' breed of *DE* is that the essences of fundamental properties are their causal dispositions.⁶⁰ The paradigm example of a property that is thought to work this way would seem to be the property of electrical charge. On this view, the very essence or nature of electrical charge consists in the causal disposition of charge: the disposition to attract opposite charge and repulse like charge. This is because, on this account, what it is for a property to be an instance of charge is for the property to possess this causal disposition. Generalizing this, Ellis proposes that the essence

⁶⁰ In contrast, Shoemaker's breed of *DE* does not characterize only fundamental properties this way. Shoemaker characterizes proprieties *in general* in terms of causal dispositions.

or nature of any fundamental property is its causal dispositions: its dispositions to produce some specific casual effects under some specific conditions.⁶¹ In his terms, all fundamental properties are “*essentially dispositional*.”

Adopting *DE*, some causal relations will turn out to hold between some events *C* and *E* due to the nature of the entities that participate in events *C* and *E*. To illustrate, say event *C* is the event in which the electrical fields of two oppositely-charged particles interact. Say event *E* is the event of these particles undergoing attraction. So, the event in which these particles’ electrical fields interact *causes* the event of these particles attracting one another: *C* causes *E*. Now, the crucial point here is that the causal explanation of *E* will qualify as a metaphysical explanation. To explain this, let’s ask: how do we causally explain the fact *FE*, where *FE* is the fact that event *E* occurred?⁶²

As it would seem, causally explaining why *E* occurred is a matter of specifying the event which *E* causally depends upon: event *C*. And so, causally explaining the fact *FE* that event *E* occurred is a matter of specifying that event *C* occurred, and that *C* caused *E*. But notice that this causal explanation of *FE* satisfies Dasgupta’s characterization of *metaphysical* explanation. For explaining *FE* by specifying that event *C* occurred, and that *C* caused *E*, is to specify what fact *FE* depends upon due to the nature of electrical charge. And since electrical charge is among the target-entities of fact *FE*, explaining *FE* in this way is to explain *FE* by specifying what fact *FE* depends

⁶¹ Ellis’ form of *DE* is *modest* in the respect that it allows that some properties, i.e. non-fundamental properties, have an essence that is independent of their causal dispositions. These are *categorical* properties. Paradigm properties of this sort would seem to be size, shape, and structural properties.

⁶² To clarify, this way of framing the question about how to causally explain *E* presumes that causal explanations are explanations of why some *facts* obtain: facts about events occurring. For what it is to causally explain any given event *E** is a matter of explaining why *it is the case* that *E** happened (via specifying the event which caused *E**). And what it is to explain why *it’s the case* that some event happened is to explain what brought about the fact that the event happened. Hence the point that causally explaining event *E* is to explain the *fact FE* that event *E* occurred.

upon *due to the nature of an entity which is among FE's target-entities*.⁶³ So, because this causal explanation qualifies as a metaphysical explanation, the distinction between causal and metaphysical explanation fails.

Further, what should not be overlooked is that *DE* entails that this example is not an isolated case. For it is not the essence of electrical charge only that can be thought to consist in causal dispositions. Many properties can be plausibly treated as essentially dispositional (i.e. treated such that they possess an essence which consists in causal dispositions). As mentioned above, Ellis (2001, 2002) holds that all fundamental properties are essentially dispositional, and some advocates of *DE* go as far to claim that *all* properties are essentially dispositional.⁶⁴ So, the point is that for any example of a property which is considered essentially dispositional, a causal explanation can be conceived which works the same way as the causal explanation in the example concerning electrical charge. In the example of electrical charge, a causal relation *CR* obtains in virtue of a disposition that is essential to some property. And the crucial feature of that example was that the causal explanation which works by appeal to *CR* turns out to qualify as a metaphysical explanation. So, generalizing the point of that example, for *any* property *P* that is considered essentially dispositional, a causal explanation can be conceived which appeals to a causal relation that obtains in virtue of a disposition that is essential to *P*. And a causal explanation of this sort, as was demonstrated by the causal explanation in the example concerning electrical charge, will accomplish the explanatory tasks which characterize metaphysical explanation. So, what follows from *DE* is that there are (at least) as

⁶³ Perhaps elaboration is called for. The here point is this. Notice that *FE* depends upon *C*'s having occurred due to the nature of electrical charge: the interaction of the electrical fields (event *C*) causes the attractive force to obtain between the given particles (event *E*) *due to the nature of electrical charge*. For it is essential to electrical charge, and thus it is in the *nature* of electrical charge, that oppositely-charged entities undergo attraction. Thus, to causally explain fact *FE* by appeal to the interaction of the fields is to specify what *FE* depends upon due to the nature of an entity that is among *FE*'s target-entities: electrical charge.

⁶⁴ See Shoemaker (1980).

many counterexamples to Dasgupta's characterization of metaphysical explanation as there are essentially dispositional properties.

The obvious objection to this counterexample is that *DE* is false. For if *DE* is false, then *DE* is not a plausible basis for portraying causal explanations. The literature on *DE* explores a huge variety of arguments for and against *DE*. I do not wish to discuss those arguments.⁶⁵ For my suggestion about the counterexample is that it is plausible to the extent that *DE* is plausible. More importantly, if *DE* is unacceptable and thus all counterexamples of the kind discussed above are unacceptable, then I rest the argument from explanation on the next counterexample to be discussed, since the next counterexample does not rely on *DE*.

Say that a “*grounding-backed*” explanation is an explanation which is backed by a grounding relation. To discuss the next counterexample, it will be helpful to reiterate that on Dasgupta's account, grounding-backed explanations and metaphysical explanations are one and the same. Thus, there are no grounding-backed explanations which are not metaphysical explanations. The counterexample to now be discussed is intended to demonstrate that this is false, since this example presents a grounding-backed explanation which does not qualify as a metaphysical explanation.

This counterexample concerns an accidental generalization (i.e. a generalization which does not hold in virtue of any laws of nature). Let's consider the accidental generalization that all cats are located on Earth. Say that *N* is the number of cats that there actually are. The fact *FC* that all cats are located on Earth is grounded by the following facts:

- The fact that there are *N* cats located on Earth.
- The fact that *N* cats are all the cats that there are.

⁶⁵ For an overview of these issues, see Bird (2007).

And just as FC is grounded by these facts, FC is *explained* by these facts. For indeed, if one specifies that there are N cats on Earth, and one specifies that N cats are all the cats that there are, then one has elucidated why it is the case that all cats are located on Earth. Call this explanation “ $FC-EX$.” As I suggest, although $FC-EX$ is clearly a grounding-backed explanation, $FC-EX$ does not satisfy Dasgupta’s characterization of metaphysical explanation. Hence, $FC-EX$ demonstrates that his account does not work because it falsely suggests that all grounding-backed explanations are metaphysical explanations.

The reason why $FC-EX$ does not satisfy Dasgupta’s characterization is that $FC-EX$ does not accomplish the explanatory tasks that Dasgupta portrays metaphysical explanation in terms of. Recall that on his account, to metaphysically explain a fact F is to explain F by appeal to what F depends upon due to the nature of one of F ’s target-entities (i.e. an entity that fact F is a fact about). But as it would seem, to explain why it is the case that all cats are located on Earth by appeal to all the instances of this generalization is not to explain a fact by appeal to *nature* of that fact’s target-entities. For the nature of cats—whatever this nature amounts to—plays no role whatsoever in the explanation $FC-EX$. Likewise, the nature of Earth and the nature of the locations on Earth where each cat might be located—whatever those natures amount to—play no role in explaining why fact FC holds. This means that explaining why FC holds is to *not* to explain it by appeal to what FC depends upon due to the nature of one of FC ’s target-entities. And thus, $FC-EX$ is a grounding backed-explanation which does not satisfy Dasgupta’s characterization of metaphysical explanation.

Further, this example is not an isolated case. As it would seem, the accidental generalization that all my socks are located in my sock drawer is another example of a grounding-backed explanation which does not qualify as a metaphysical explanation. For explaining why this generalization holds by appeal to its instances does not seem to appeal to the nature of anything

whatsoever. That is, explaining the fact that all my socks are located in my sock drawer will not rely on information about the nature of any entities whatsoever. Though, explaining this will rely on specifying the facts about where each of my socks is located: facts which *ground* the generalization that all my socks are located in my sock drawer. Hence, this is another case of a grounding-backed explanation that is not a metaphysical explanation. And obviously, countless examples of accidental generalizations like this can be conceived. Thus, there is a huge abundance of counterexamples of this kind.

With these points in mind, I propose that the distinction between causal and metaphysical explanation does not hold. This speaks in favor of *GCI* and in disfavor of *GCN*, for *GCI* is better suited to there being no distinction between these kinds of explanation. As I said above, *GCI* can treat the lack of distinction between these kinds of explanation such that it reflects the lack of distinction between causation and grounding. In contrast, *GCN* must treat the lack of distinction between these kinds of explanation in such a way that it fails to reflect the distinction between causation and grounding.

Of course, one can deny that explanations need to reflect the identity or non-identity of their backing relations. But the point here is simply that it is advantageous of a view to treat the relations in a way that matches how the relations' corresponding explanations work. For presumably, the explanations correspond to these relations because these explanations *capture* how these relations work to at least *some* extent. So, if a view's treatment of the relations matches how the relations are captured by explanation, then this speaks in favor of the view. For the way that the view purports to capture the relations is consistent with how explanation captures the relations, which supports the idea that the view's treatment of the relations is accurate.

2.5. The Argument from Double-Crossers

The last point of comparison to be discussed in this chapter concerns what I dub “double-crossers”: dependence relations which hold across both time and ontological levels. As I will argue, double-crossers pose no problem for *GCI*, though they pose a serious problem for all varieties of *GCN*. So, as with the last argument, I will direct this argument at *GCN* in general rather than just moderate-*GCN*.

Before discussing the argument, I offer an elucidation of what double-crossers are via the following example. Say *B* is Alex’s brain state which obtains at T_1 . Imagine that *B* causes Alex’s future brain state *B** which obtains at T_2 . Next, imagine that *B** gives rise to, and thus grounds, Alex’s mental state *M* which also obtains at T_2 . Given how these three states are connected, notice the statement *S* is true that “Alex’s mental state *M* depends upon *B*.” Now, let’s ask: what is the truthmaker for *S*? One might answer this by saying that the truthmaker for *S* is the fact that the following two conditions hold. Firstly, a dependence relation R_1 holds between *B* and *B**: the time-crossing, causal dependence relation by which *B* causes *B**. Secondly, a dependence relation R_2 holds between *M* and *B**: the ontological-level-crossing grounding dependence relation by which *B** grounds *M*. At first glance, this sounds like a plausible way of accounting for what makes *S* true. But upon closer inspection, this way of understanding the example does not work. For this way of understanding the example fails to account for the *transitivity* of the connection of dependence between brain state *B* and mental state *M*.

Since the dependence between *B* and *M* is transitive, there must be a *single* dependence relation between *B* and *M* which bears this transitivity. That is, the transitivity of the dependence between *M* and *B* cannot be accounted for solely in terms of R_1 connecting *B* to *B** and R_2 connecting *B** to *M*. To account for the dependence between *M* and *B* being *transitive*, this dependence must hold between all three states in question: this dependence must extend from brain

state B to brain state B^* to mental state M . Thus, there must be a dependence relation R_3 *over and above* R_1 and R_2 which relates all three of Alex's relevant states. As it would seem, R_3 is a *composite* dependence relation which consists in the chain of dependence built from R_1 and R_2 : R_3 is the chain of dependence that consists in R_1 linking brain state B to brain state B^* and R_2 linking brain state B^* to mental state M .

The crucial point to note about R_3 is that R_3 is a dependence relation which extends across time *and* ontological levels, and thus in this respect, R_3 qualifies as a *double-crosser*. To make explicit why R_3 extends across time: this is simply because R_3 connects brain state B to mental state M , which obtain at different times (B obtains at T_1 and M obtains at T_2). To make explicit why R_3 extends across ontological levels, this is because R_3 extends from brain state B^* to mental state M . That is, since M is derivative of B^* , presumably, B^* is comparatively more fundamental than M , which means that B^* occupies a comparatively deeper ontological level than M . Hence, R_3 extends from one level of reality to another (since R_3 extends from the level where B is located to the level where M is located).

Since double-crossers cross both time and ontological levels, this would appear to make them anomalous in the following respect. *Prima facie*, crossing ontological levels would seem to be a prominent, telltale characteristic of grounding. And *prima facie*, crossing time would seem to be a prominent, telltale characteristic of causation.⁶⁶ So, because double-crossers cross both ontological levels and time, double-crossers might appear to be both causal and “*groundal*”; i.e. *of the grounding variety*. One might ask how such anomalous dependence relations would be accounted for by different theories of grounding. Specifically, one might ask how *GCI* and its rival views compare with respect to how they account for this anomalous kind of dependence. This is the point of

⁶⁶ More will be said about these issues in later chapters.

comparison which the *argument from double-crossers* is based upon. The intended conclusion of the argument is as follows. As I suggest, *GCN* is committed to a deeply problematic treatment of double-crossers (or more specifically, the *relata* of double-crossers), whereas *GCI* offers an innocuous treatment of double-crossers (and their *relata*).

Focusing on *GCI* first, this view has no trouble whatsoever making sense of double-crossers. Since *GCI* holds that the distinction between causation and grounding is a false distinction, *GCI* implies that double-crossers do not have a dual status of being both causal and groundal. On *GCI*, “causal” and “groundal” do not denote different statuses or different natures of dependence relations: the difference between causal and groundal dependence is nominal. Likewise, *GCI* has no difficulty accounting for the feature of double-crossers such that they cross both time and ontological levels. This is because, insofar as *GCI* treats dependence relations, double-crossers having this feature does not make double-crossers novel in any important way. On *GCI*, how dependence relations differ with respect to crossing time or levels does not correspond to any difference in the nature of a dependence relation: dependence is just dependence, regardless of time-crossing status or level-crossing status. So as I suggest, since *GCI* implies that there is nothing genuinely anomalous about double-crossers, double-crossers pose no difficulty for *GCI*.

In contrast, *GCN* cannot innocuously account for double-crossers. *GCN* affirms the distinction between causation and grounding, and one of the most standard ways this distinction is understood is in terms of the ordering that grounding imposes. As it's typically thought, grounding imposes a *fundamentality ordering* upon its *relata*, meaning: if *X* grounds *Y*, then *X* is fundamental to *Y* and *Y* is derivative of *X*. And this is standardly treated as *exclusive* to grounding: grounding, *and grounding only*, imposes a fundamentality ordering upon its *relata*. Further, this treatment of grounding would seem to be *indispensable* for the who conceive of grounding as *non-causal*. For without this

treatment, it's not clear how grounding—conceived of as non-causal—would even be understood to begin with.

Thus I take it that *GCN* presumes that grounding, and grounding only, imposes fundamentality orderings. And this suggests that on *GCN*, one of the features by which grounding is *individuated* (and thus which distinguishes grounding from causation) is grounding's feature of imposing fundamentality orderings. Now, the important point here is this. If this feature is indeed one of the features that individuates grounding, then fundamentality orderings and causal orderings are *mutually exclusive*: the orderings which the relations impose *must* be mutually exclusive since the orderings are what distinguish the relations from one another (or at least, the orderings are *one* the things that distinguish the relations from one another).⁶⁷ This is precisely what commits *GCN* to a problematic treatment of double-crossers.

To explain the issue carefully, I reiterate that since double-crossers cross ontological levels, and thus double-crossers connect derivative entities to what they depend upon at a deeper level of reality, *prima facie* double-crossers qualify as grounding relations. This means that *GCN* would treat double-crossers such that double-crossers impose upon their relata a *fundamentality ordering*: if *Y* “*double-cross depends*” upon *X* (such as *M* depends upon *B* for instance), then *X* is fundamental to *Y* and *Y* is derivative of *X*. Further, since double-crossers cross time, *prima facie* double-crossers qualify as causal relations. This means that *GCN* would treat double-crossers such that double-crossers impose upon their relata a *causal ordering*: if *Y double-cross depends* upon *X*, then *X* is causally prior to *Y* and *Y* is causally posterior to *X*. Putting all of this together, *GCN* entails that if *Y double-cross depends* upon *X*, then following conditions hold:

- *X* is fundamental to *Y* and *Y* is derivative of *X*.

⁶⁷ More about this issue will be said in chapters 4 and 5.

- X is causally prior to Y and Y is causally posterior to X .

This is how (or this is at least *partially* how) *GCN* would cash out the idea the double-crossers are both groundal and causal. As I propose, this is an untenable treatment of double-crossers. More specifically, this is untenable treatment of the *relata* of double-crossers. For this way of treating such *relata* is to attribute to them incompatible statuses, or said differently, contradictory properties. For as it was established, on *GCN*, fundamentality orderings and causal orderings are mutually exclusive. Since these orderings are mutually exclusive, *GCN* therefore entails:

- If X is fundamental to Y , then X is not causally prior to Y .
- If Y is derivative of X , then Y is not causally posterior to X .

So *GCN* is committed to treating the *relata* of double-crossers as follows. If Y double-cross depends upon X , then:

- X is *and is not* fundamental to Y , and X is *and is not* causally prior to Y .
- Y is *and is not* derivative of X , and Y is *and is not* causally posterior to X .

GCN is thus committed to an unworkable treatment of the *relata* of double-crossers. This is in stark contrast to *GCI*'s innocuous treatment of double-crossers and their *relata*. Hence we have the argument from double-crossers: whereas *GCN* is committed to an unworkable treatment of the *relata* of double-crossers, *GCI* provides an innocuous treatment of such *relata*. So, with respect to how the views treat double-crossers, *GCI* is the more plausible view.

3

The Argument from Instability Part 1: Examining the Integrated Differences between Causation and Grounding

3.1. Overview of the Argument from Instability

The previous chapter presented various considerations in favor of thinking that *GCI* is just as plausible as moderate-*GCN*. However, those considerations might be argumentatively outweighed by other considerations which speak against *GCI*: considerations concerning the purported differences between causation and grounding. Thus, these purported differences are a crucial point of comparison between *GCI* and moderate-*GCN*. For if one thinks that the relations do indeed bear these differences, then one must affirm that the distinction between the causation and grounding holds. And if one affirms that the distinction holds, then one must deny that *GCI* holds, since *GCI* relies on *denying* that the distinction holds. Hence, the considerations from the previous chapter, which spoke in favor of *GCI* being just as plausible as moderate-*GCN*, would be argumentatively outweighed by this crucial problem and *GCI* would need to be rejected. In this case, moderate-*GCN* would turn out to be the most plausible view in question. Conversely, if all the purported differences between the relations can be rejected or called into substantial doubt, then the distinction between the relations can be plausibly denied. And therefore, *GCI* need not be rejected.

This chapter and the next discuss these purported differences between the relations, and hence they address the fifth point of comparison between the views in question. These two chapters

present the “argument from instability.” This argument is intended to establish that all the purported differences between causation and grounding can be rejected or called into substantial doubt. Thus, in my terminology, all the purported differences between the relations are argumentatively “*unstable*,” and so the distinction between the relations is argumentatively *unstable*. For if all the differences between the relations can be rejected or doubted, then there is no argumentatively stable foundation for affirming that the distinction holds. In this case, the distinction could be plausibly denied and *GCI* need not be rejected. Hence the name of the argument and the thematic phrases *unstable* and *instability* which reoccur throughout this chapter and the next.⁶⁸

This chapter presents part 1 of the argument from instability. Part 1 addresses a cluster of argumentatively-*integrated* differences between causation and grounding. These differences are argumentatively integrated in the sense that, if one thinks that one of these differences in the cluster holds, then this provides support for thinking that some of the other differences in the cluster hold. Conversely, if one thinks that one of the differences in the cluster does *not* hold, this provides support for thinking that some of the other differences in the cluster do not hold. Thus, many of the criticisms of these integrated differences will rely upon one another. In contrast, part 2 of the argument from instability, addressed in chapter 4, is focused upon argumentatively-*unintegrated* differences between the relations: differences which are argumentatively independent of one another and thus require criticisms that are independent of one another.

⁶⁸ Further, there is a metaphor which inspired the use of this terminology. We might think of the distinction between causation and grounding in terms of a wall which separates the relations. Those who wish to deny *GCI* wish to keep the wall from falling over, since they wish to affirm the distinction between the relations. So, since the argument from instability is intended to call the distinction into doubt, we might think that the goal of the argument is to show that the wall does not stand upon a firm foundation; i.e. the wall is unstable. Hence, since the argument is intended to show that the wall is unstable, the argument is intended to show that it is reasonable that the wall can be knocked over, meaning: one can plausibly deny the distinction between causation and grounding since the distinction does not stand upon a firm argumentative foundation.

I will conclude from the argument from instability that the considerations in favor of thinking that the distinction between the relations holds are paralleled by considerations *against* thinking that the distinction holds. Thus, the appeal to the purported differences between the relations does not decisively settle the matter of comparing *GCI* with moderate-*GCN*.

3.2. The Instability of a Difference Regarding Modal Profile

3.2. A. The Argument from Modal Profile

What I'll call the "argument from modal profile" is the argument according to which the distinct modal profiles of causation and grounding serve to mark the distinction between these relations. As expressed by Rosen (2010):

The facts that ground [the fact that p] together ensure as a matter of metaphysical necessity that [the fact that p] obtains. This is one respect in which the grounding relation differs from causal and other merely nomic forms of determination. (118)

To critically assess the argument, what needs to be clarified is how the metaphysical necessity of grounding is to be understood. Firstly, the necessity of grounding might be understood in terms of a symmetric necessitation relation between grounds and grounded: if *X* grounds *Y*, then at every possible world where either of these entities obtain, the other obtains as well. However, this is *not* how the modal necessity of grounding is typically understood. For this understanding implies that both a "bottom-up" necessitation relation and a "top-down" necessitation relation holds between grounds and grounded, as these are sometimes called. Bottom-up necessitation between grounds and grounded is such that if *X* grounds *Y*, then *X* necessitates *Y*: at every possible world where the given *grounding* entities obtain, the given *grounded* entities obtain. Top-down necessitation between grounds and grounded goes in the other direction. That is, if *X* grounds *Y*, then *Y* necessitates *X*: at every possible world where the given *grounded* entities obtain, the given *grounding* entities obtain.

The claim that grounding is metaphysically necessary is typically *not* understood to mean that top-down necessitation holds between grounds and grounded. This is because, as discussed in chapter 1, grounding is supposed to be compatible with multiple realization. More specifically, grounded entities are supposed to be capable of being multiply realized. And this means that if some multiply-realizable grounded entities are grounded by the *Xs*, then these grounded entities do not necessitate the *Xs* (i.e. these grounded entities can obtain at a possible world where they are realized by, and thus grounded by, entities other than the *Xs*).⁶⁹ In contrast, the claim that grounding is metaphysically necessary *is* typically understood to mean that bottom-up necessitation holds between grounds and grounded.

However, bottom-up necessitation can itself be understood in different ways. On one understanding, bottom-up necessitation between grounds and grounded works as follows. If *X* grounds *Y*, then two conditions hold:

- Every possible world at which *X* obtains, *Y* obtains.
- Every possible world at which *X* obtains, *X* grounds *Y*.

On a weaker understanding of bottom-up necessitation, the second condition above is omitted. Thus, on this weaker understanding, bottom-up necessitation between grounds and grounded is just the modal connection between the obtaining of the grounds and the obtaining of the grounded: every possible world at which *X* obtains, *Y* obtains. This weaker understanding of bottom-up necessitation is what grounding's alleged metaphysical necessity is standardly understood in terms of. That is, the alleged necessitation between grounds and grounded is standardly treated as *weak bottom-*

⁶⁹ To illustrate, say that mental states are grounded in neural states in the actual world and that mental states are multiply realizable. Since they are multiply realizable, mental states can obtain at some possible worlds where they are realized by, and thus grounded by, something distinct from neural states. Thus, mental states would not necessitate what grounds them.

up necessitation. And to further clarify, on this standard treatment, weak bottom-up necessitation is not supposed to be *sufficient* for grounding: it does not hold that if X necessitates Y in the relevant sense, then X grounds Y . This is because, echoing comments from chapter 1, some of the theoretical roles that grounding is posited to play are roles which require that grounding cannot be captured by purely modal connections like necessitation.⁷⁰ Instead of being a sufficient condition for grounding, the relevant kind of necessitation is supposed to be only a *necessary* condition for grounding: if X grounds Y , then X necessitates Y in the relevant sense.

This standard treatment of grounding's modal profile will be what the discussion below addresses. Thus, the claim that grounding is metaphysical necessary is to be understood below as the claim that in all cases of grounding, weak bottom-up necessitation holds between grounds and grounded. Borrowing terminology from Skiles (2015), I will call the view on which this claim holds "grounding necessitarianism" and "GN" for short.

With these clarifications made, the argument from modal profile can now be assessed.

Presented formally, the argument is this:

Premise 1: Causation holds with nomological necessity.

Premise 2: Grounding holds with metaphysical necessity (i.e. GN holds).

Conclusion: Causation and grounding are distinct.

To challenge this argument, I will challenge premise 2 and thus, challenge GN. By challenging GN, I will be arguing in support of the alternative view on which grounding is contingent in at least some cases. Though there are many approaches available to challenge GN, to limit the discussion of this

⁷⁰ For instance, grounding's role of backing explanation requires that grounding cannot be characterized in purely modal terms.

issue here to a reasonable length, I will focus upon just one approach: presenting counterexamples to this view, that is, examples in which weak bottom-up necessitation does not hold between grounds and grounded. Since recent publications have provided much relevant discussion on this issue and relevant issues, I will appeal to various independent sources to assemble my list of such counterexamples.

3.2. B. Counterexamples to Grounding Necessitarianism

Counterexample 1: Composition

It would seem there are many species of grounding. For instance, the grounding relations between truths and truthmakers, or between properties and substances, or between determinates and determinables would all seem to be different species of grounding. Given the intuitive assumption that there is asymmetrical dependence that runs from mereological parts to mereological composites,⁷¹ composites would seem to be grounded by that which composes them. Thus, composition would seem to be a species of grounding.

I'll argue that composition is a species of grounding for which weak bottom-up necessitation does not hold. That is, I'll argue that at some possible worlds, facts obtain which bring it about that simples compose. Thus, at these possible worlds, these facts ground the existence of composites. But at other possible worlds, these same facts obtain though these facts fail to bring it about that simples compose. So, these facts ground the existence of composites but they do not necessitate the existence of composites in the way that *GN* requires: a weak bottom-up necessitation relation does not hold between these facts and the existence of composites.

Some background will be helpful to set up the discussion. The “special composition question,” as it has typically been called since van Inwagen (1990), asks when composition occurs.

⁷¹ The intuition here is that the existence of a composite *C* requires the existence of the objects which serve as its parts despite that the existence of the objects which serves as *C*'s parts does not require that *C* exists.

Said differently, this question asks what the conditions are under which composition occurs. *Universalists* reply to this question with “always”: all collections of simples compose under any conditions in which they exist. *Nihilists* reply with “never”: under no conditions do simples compose. And some reply with “sometimes”: under some restricted conditions simples compose. But as Cameron (2007) points out: “even though there is widespread disagreement as to what the answer to [the special composition question] is, there is widespread agreement that whatever the answer is, it is a necessary truth” (100).⁷² I’ll call this view that the correct answer to the special composition is a necessary truth “composition necessitarianism” and abbreviate this as “*CN*.”

As *CN* has it, the view which correctly answers the special composition question is the view which correctly describes how the facts about composition work at every possible world. On *CN*, if universalism is true, then simples compose at every possible world where simples exist.⁷³ On *CN*, if nihilism is correct, then composition doesn’t occur at any possible worlds.⁷⁴ And on *CN*, if the view that composition occurs under some restricted conditions is correct, then composition occurs at every possible world where simples meet these restricted conditions, whatever those conditions are.

Now, notice why *CN* is consistent with *GN*. According to *CN*, every possible world that is the same with respect to facts about simples will be the same with respect to the facts about whether or not composites are composed by these simples. Thus, every possible world that is the same with respect to facts about simples will be the same with respect to what is *grounded* by these facts about simples. This means that if some facts ground the existence of composites at some possible worlds,

⁷² He offers the following examples of accounts which explicitly endorse this claim: Armstrong (1997), Markosian (1998) and Sider (2001).

⁷³ This is because on universalism, all conditions that simples meet are the conditions under which simples compose. So in every world at which simples exist, simples satisfy the conditions of composition because whatever conditions they happen to meet, those conditions suffice for composition to occur.

⁷⁴ Thus, all worlds match with respect to their facts about composition because at all worlds, there are no conditions under which composition occurs.

then these grounding facts necessitate what they ground in the way required by *GN*. For the existence of composites will obtain at every world where the relevant facts about simples obtain.

The alternative view, the view that composition is contingent, is *inconsistent* with *GN*. On this view, possible worlds that are the same with respect to facts about simples can differ with respect to the facts about whether or not composites are composed by simples. Thus, every possible world that is the same with respect to facts about simples will be *not* the same with respect to what is *grounded* by these facts about simples. For some fact about simples ground the existence of composites as some possible worlds, although these same facts obtain at other possible worlds without grounding the existence of composites. This means that weak bottom-up necessitation does *not* hold between grounds and grounded in the case of composition, since weak bottom-up necessitation does not hold between the relevant facts about simples and the existence of composites.

Since this view is inconsistent with *GN*, and since the argument from modal profile relies on *GN*, the view that composition is contingent undermines the argument from modal profile. By appeal to Cameron (2007)'s defense of the view that composition is contingent, I'll argue against *CN* in order to argue against *GN* and thus, against the argument from modal profile.⁷⁵

Cameron's critique of *CN* is based on what he considers to be an unfulfilled burden of proof that rests on the shoulders the *CN* advocate. In the absence of a satisfying justification of *CN*, *CN* is a mere assumption: the alleged metaphysical necessity of composition is an "unexplained necessity," as Cameron calls it. In defense of his position, Cameron criticizes a variety of arguments in favor of *CN*. I will discuss what I consider to be the most important of these below and add some of my own claims along the way.

⁷⁵ All quotations of Cameron in this section come from Cameron (2007), and all discussion of Cameron's arguments and view concerning composition is directed at or expressive of Cameron (2007).

Firstly, Cameron criticizes an argument according to which the necessity of composition follows from the alleged analyticity of true propositions which assert that composition occurs under some set of conditions. Cameron argues that propositions which assert that composition occurs are more plausibly considered to be *synthetic*, and thus the necessity associated with analyticity is not a plausible basis for arguing in favor of *CN*:

It is not analytic, seemingly, that ‘if [a collection of objects exist and satisfy some conditions] ... then there is an object that is their fusion’... Indeed. The sentence [just mentioned above] conditionally asserts the existence of some thing on some conditions that do not mention the existence of that thing, and it does not seem that such a sentence could be analytic. Existence claims are, seemingly, never analytic; so it seems that a conditional whose consequent was an existence claim could be analytic only if the antecedent asserted the existence of the thing in question. But if the sentence ‘If some objects are in conditions *C*, then there exists something that is composed of those objects’ is informative then the antecedent does not assert the existence of the thing in question (namely, the sum of the objects in conditions *C*). The sentence is synthetic, then; there is nothing in the concept of certain things meeting certain conditions that there is a fusion of those objects. As a result there is no incoherence in the thought that things meet those conditions but fail to compose anything. (102)⁷⁶

Further, Cameron criticizes an argument according to which the necessity of composition follows from “*composition-as-identity*”: the view that “a thing is identical to its parts (as opposed to the sum of its parts)” (103). According to *composition-as-identity*, the mere existence of simples is the condition under which composites exist, for composites are identical with the simples that compose them. And so, as the argument goes, the necessity of composition would follow from the necessity of identity: because the identity between composites and simples obtains in every world at which there are simples, composites exist at every world at which simples exist. And so, composition

⁷⁶ Though, it should be noted that Cameron explicitly acknowledges that conceptual coherence does not entail metaphysical possibility. The fact that it is conceptually coherent that objects do not compose despite that they meet the conditions of composition does not entail that this is metaphysically possible. He suggests however, that for cases other than composition the reasons for thinking that some conceptual possibility does not correspond to a metaphysical possibility are reasons that do not apply in the case concerning possibilities about composition.

occurs under the same conditions at every world: the condition that simples exist. Thus, composition is metaphysically necessary. Against this, Cameron argues as follows:

My claim is that it only makes sense to ascribe a property like being self-identical to a plurality of things if there is some one thing that the plurality is identical to; i.e. if there is a one thing that the many are identical to... One can only infer that x_1 to x_n have the property of being self-identical at a world if we know that x_1 to x_n are identical to some thing at that world—i.e. if we know that they compose at that world (since, we are assuming for the sake of argument, what it is for a collection to compose is for them to be identical to some thing). So one cannot simply assume that x_1 to x_n are necessarily self-identical; to make this claim we would need to have a reason for thinking that they are necessarily identical to some thing or other. But that is simply the claim that they necessarily compose, which just begs the question. (105)

Thus, he suggests that composition as identity is compatible with the idea that composition is contingent. Even assuming composition as identity, one is logically required to ascribe the identity between a composite and its plurality of parts at a world *only* if one agrees that composition takes place at that possible world under consideration. That is, one is required to affirm the consequent of the following conditional proposition only if one affirms the antecedent of the conditional: “If a composite X exists at a possible world W then X is necessarily identical to the plurality of its parts at W .” Without first affirming the antecedent, one is not required to affirm the consequent.

So even assuming that composites are identical with the plurality of the simples that compose them, Cameron suggests that this plurality *is* only has the property of being self-identical *if* these simples compose.⁷⁷ To claim that a collection of simples compose at any possible world under

⁷⁷ Cameron’s suggestion here can be explained in terms of an analogy with one of Immanuel Kant’s criticisms of the ontological argument for the existence of god that Kant offers in the first *Critique*. Kant responds to the claim that to comprehend the notion of a being that necessarily exists is to ascribe such a being existence. This is because entertaining the very thought of a necessarily existing being *is* to entertain the thought of a being that cannot, without contradiction, be thought to not exist. As Kant argues against this, one is not logically forced to ascribe any predicate (such as “exists”) to a necessarily existing being unless one antecedently recognizes the existence of such a being. That is, one is only logically required to affirm the consequent of the conditional “If a necessarily existing being exists, then it necessarily exists” if one affirms the antecedent of the conditional: only if one initially agrees that such a being exists is one logically pressured to ascribe existence to this being. Cameron’s point about composition as identity seems to work the same way. He suggest that only if one initially agrees that composition takes place in a possible world under consideration is one logically pressured to ascribe the identity between a composite and its plurality of parts.

consideration is to beg the question in favor of *CN* because it is to assume that composition is metaphysically necessary. Hence the appeal to composition as identity fails to plausibly justify *CN*.

This latter argument which works by appeal to composition-as-identity is very similar to another argument that Cameron criticizes: an argument which works by appeal to universalism. On universalism, objects compose under any conditions (though on this view, composites are not identical to their parts, whereas they *are* identical according to composition as identity). Universalism may appear to entail that in every world at which there are objects, composition occurs, and thus composition is metaphysically necessary.

But this argument fails for the same reason that the argument discussed above does which concerns composition-as-identity: the *CN* advocate cannot appeal to universalism to justify her view without begging the question. Here's why. As Cameron has it, one could endorse universalism with or without assuming *CN*. Without assuming *CN*, universalism amounts to the view that at all possible worlds in which composition occurs, composition is facilitated by whatever the conditions are of the objects at the worlds in question. Without assuming *CN*, universalism does *not* entail the claim that all worlds which contain objects are worlds where composition occurs. In order for universalism to entail this claim, one must endorse universalism in conjunction with the assumption that composition occurs at every world at which objects exist, which is to assume *CN*.

Therefore, to appeal to universalism in order to justify *CN* would only work if one assumes *CN*, and so this is a question-begging maneuver to appeal to universalism.⁷⁸ Without assuming *CN*, universalism is compatible with the idea that composition occurs at some worlds (at which simples

⁷⁸ To be clear, the claim here is not that the universalist is logically prohibited from assuming *CN*. The claim is that if the *CN* advocate wants to justify her view, universalism by itself will not serve this purpose. Only if universalism is question-beggingly combined with *CN* does not universalism justify *CN*. Without the assumption of *CN*, universalism is compatible with the claim that there are worlds with simples which do not compose and thus it is compatible with the claim that composition is contingent.

exist) but does not occur at other worlds (at which simples exist). Thus universalism is compatible with the claim that composition is contingent,⁷⁹ and so *CN* cannot be justified by appeal to universalism.

Alternatively, the *CN* advocate might attempt to justify her view by appeal to the alleged a priori status of facts about composition: if it is a priori that simples compose under some set of conditions *C* and facts which are a priori are metaphysically necessary, this entails that it's metaphysically necessary that simples compose under conditions *C*. Against this, Cameron proposes that this argument hinges on a confusion about the a priori status of beliefs about composition. For the sake of argument, grant the assumption that our beliefs about simples composing are not beliefs which are based upon by empirical observation and thus these beliefs do indeed rest on some a priori basis. Even granting this, Cameron proposes that this assumption does not entail that the facts about composition are *known* a priori, for they are merely *justified* a priori. And these facts being justified a priori is compatible with the claim that the facts about composition are contingent:

When we say that a proposition is a priori, this means that it can be known on the basis of justification which is not empirical. But justification does not entail truth; a proposition could be justified in every possible world but not knowable in every possible world, precisely because it is only knowable in the worlds in which it is true. So suppose the compositional facts are a priori. All that means is that the justification by which we come to know those facts is non-empirical. But the facts could still be contingent: it's simply that in the worlds in which they are false are worlds in which I could come to have non-empirical justification for some falsehood. I couldn't come to know the facts in those worlds, of course; I can only come to know those facts if the world cooperates to make my justification lead to knowledge, which only happens in worlds in which the facts are true. This is an externalist story then; because my justification is a priori, it is obtainable in every possible world. But my justified belief only counts as knowledge in worlds where the world cooperates: where the justified belief is true. So the argument from a priority to necessity fails because it assumes that the way the world is plays no part in my coming to know that *p*. What is true is just that it plays no part in my coming to have a justified belief that *p*; but it does play a part

⁷⁹ On this picture, at the worlds where composition occurs composition is facilitated by all conditions that objects meet at those worlds. At other worlds, composition does not occur but if composition *had* occurred at those worlds it would have been facilitated by whatever the conditions of the objects are at those worlds. So although composition is contingent on this picture, the basis of universalism is maintained: the claim is maintained that the conditions which facilitate composition are all conditions met by objects which compose.

in my coming to know that p , because my justified belief only amounts to knowledge if p is in fact true. (108)

So then, the a priori status of facts about composition does not entail *CN*: despite the fact that the justification of beliefs about composition is a priori, worlds could differ with respect to their compositional facts. That is, although our beliefs about composition are justified a priori it could be the case that some worlds match these beliefs and some do not.

Further, Cameron addresses an argument for *CN* which works by appeal to “mixed worlds.” Mixed worlds are supposed to be possible worlds at which some collections of simples meet some conditions C and compose and at which some other collections of simples meet these same conditions C but do *not* compose. The *CN* advocate might argue that denying *CN* would commit one to the possibility of mixed worlds, which is an unacceptable commitment.

The argument runs as follows. Assume for argument’s sake that composition is contingent. So, there is some set of possible worlds S_1 that contain objects which meet conditions C under which composition occurs. Hence objects compose at these worlds in S_1 . Now, given the assumption that composition is contingent, there is a set of worlds S_2 at which objects meet conditions C but do not compose. Because of this, in Cameron’s words: “we can construct a third world pieced together from these two worlds in which some objects meet conditions C and compose, and some objects meet conditions C and do not compose” (110).

That is, the contingency of composition grants composition a modal freedom which allows for the worlds in set S_1 and set S_2 to differ with respect to their compositional facts despite that these worlds match with respect their facts about simples. This same modal freedom would also allow for two sets of facts that obtain *at a single world* to have the same comparative relationship: two sets of facts, each of which are identical with respect to simples but which differ with respect to whether

these simples compose, could obtain at the same possible world. So accepting the contingency of composition commits one to mixed worlds. But, the commitment to mixed worlds is unacceptable, as the argument would go, and so one must endorse *CN* to avoid the commitment to mixed worlds.

Why is the commitment to mixed worlds supposed to be problematic? Although Cameron explores a few different reasons why, I consider the following to be the fundamental problem with accepting mixed worlds. There should be something in either the compositional facts or the non-compositional facts that would explain why one collection of objects (which satisfies *C*) composes at a world *W* and why another collection of objects (which also satisfies *C*) does not compose at *W*. But, there isn't anything to appeal to in either the compositional facts or the non-compositional facts to account for the difference. So the difference is inexplicable.

I agree that this inexplicability seems problematic but I think the argument fails nonetheless. Further, I propose that it fails for a different reason than those which Cameron offers in critical response to the argument. If one were to accept the mixed worlds argument for *CN*, by parody of reasoning, they would be committed to concluding that causation is metaphysically necessary. Here's why. The line of thought suggested by the argument would have us conclude that a given relation is to be treated as metaphysically necessary if treating it as contingent commits us to mixed worlds. And so, treating causation as contingent would commit us to mixed worlds, just as it would with composition. That is, if causation is contingent then this would allow for possible worlds that are mixed with respect to their causal facts.

To illustrate this point, say it is a causal law at some worlds that when objects satisfy conditions *C**, they engage in a kind of causal event *E*. Due to the contingency of causal laws, there will be some worlds that contain objects which satisfy *C** but which do not engage in *E*. And in virtue of this "we can construct a third world" where various objects meet conditions *C** but in

which case some do and some do not engage in *E*. Hence the contingency of causal laws allows for the possibility of causally mixed worlds. The difference between the set of causally mixed facts in these worlds would be inexplicable in the very same way that the difference is inexplicable between mixed compositional facts. And so, if we are to avoid commitment to an inexplicable difference in these mixed causal facts we must agree that causation is metaphysical necessary. Assuming that causation is (at least sometimes) contingent, the line of thought underlying the mixed worlds argument in favor of *CN* would imply the false conclusion that causation is metaphysically necessary. Thus, the argument fails.

With all of this said, I hope the discussion in this section makes plausible the claim that composition is contingent. If so, this implies that composition is a plausible example of contingent grounding and thus the argument from modality fails, for it relies on the metaphysical necessity of grounding.

Counterexample 2: Compositional Rearrangement

Above I had argued that composition is a contingent species of grounding in the sense that worlds can be identical with respect to their facts about simples and yet differ with respect to the facts about whether or not composition occurs. Thus, facts about simples ground but don't necessitate facts about composites, and so *GN* is false. Skiles (2015, section 3) suggests a counterexample to *GN* which also concerns composition but not on such a broad scale as my argument, which was concerned with the modal strength of composition as a general relation type. Skiles' example is a very specific case of composition which he calls "Theseus-style rearrangement."

This example runs as follows. Say that some composite is composed of a collection of parts "*C*" which assume an arrangement "*A*" at time *T*₁. Call the conjunctive fact that these parts exist and assume this arrangement "*F*₁." Call the fact that this specific composite exists "*F*₂." Because the

existence of this composite obtains in virtue of C assuming arrangement A , F_1 grounds F_2 . Skiles' "rearrangement" scenario is intended to demonstrate a case in which F_1 obtains in some instance without F_2 obtaining. And thus, although F_1 grounds F_2 , F_1 can obtain without F_2 obtaining, which renders the grounding relation between F_1 and F_2 contingent. Or more specifically, the grounding relation between F_1 and F_2 is a grounding for which weak bottom-up necessitation does not hold.⁸⁰

Here's how the rearrangement example works. Using the classic example of the Ship of Theseus, say that the fact that this ship (this specific composite) exists is F_2 . Consider C to be the collection of parts that compose the ship. Consider their arrangement to be A , and consider F_1 to be the conjunctive fact that these parts exist and assume arrangement A . Thus, in virtue of the parts existing and being arranged as they are, the existence of the ship obtains: F_1 grounds F_2 .

Now imagine that one of the many parts in C is replaced with a duplicate. Assuming that composites can survive extremely slight change in their parts, the ship would still exist despite one of its parts being replaced. Imagine next that this very slight change is repeated over and over, one part at a time. Because each change was slight enough such that the composite presumably survives each of them, this process of change eventually results with the ship being composed of none of the parts that were originally in C . And so the ship is eventually composed of entirely new parts at a later time T_2 . Next, imagine that at T_2 all of the parts that were originally in C again assume arrangement A , just as they had at T_1 .

The parts thus compose a new ship at T_2 : a clone ship. Imagine finally that the Ship of Theseus is destroyed, leaving only the clone ship existing at time T_3 . And so at T_1 , F_1 obtains but it grounds the existence of the clone ship rather than the Ship of Theseus. Thus, the grounding

⁸⁰ That is, the grounding relation in the example is such that X grounds Y at some possible worlds, though X obtains at other possible worlds where Y does not obtain.

relation that obtained at T_1 between F_1 and F_2 is contingent: at T_1 , F_1 grounds F_2 but at T_3 , F_1 obtains despite that F_2 does not obtain (for F_1 grounds the existence of the clone ship rather than the Ship of Theseus). So this serves as a case in which a fact set that serves to ground another in one case but fails to do in some other case.

Generalizing the point of the example, the parts that assume an arrangement and thereby ground the existence of some composite object O can be re-assembled into the same arrangement and yet ground the existence of a distinct object O^* . And so the facts which ground the existence of O in some instance can obtain without the existence of O obtaining in another instance. Thus, grounding and weak bottom-up necessitation come apart and so *GN* is falsified.⁸¹

Counterexample 3: Grounding Prevention

Leuenberger (2014, section 2.2) suggests a counterexample to *GN* that concerns the grounding relation between a dispositional property and its grounding categorical properties. He illustrates this with a glass's dispositional property of fragility and the glass's molecular bonding that the glass is fragile in virtue of. Assuming basic chemistry, molecular properties are governed by natural laws. Likewise, facts about an object that obtain in virtue of these properties, such as an object being fragile, are law-determined facts. Because of this, the molecular bonding of the glass does not serve as the complete grounds for the glass's fragility. The complete grounds are the glass's molecular properties plus the relevant natural laws that act upon these properties such that these properties give rise to the glass's disposition of fragility. Call these relevant laws the "R laws." Further, let's use

⁸¹ As Skiles (ibid., p. 6) puts it: "... even though the existence of at least one possible ordinary composite is grounded in the arrangement of its parts at one time, it is possible for these parts to 'scatter' and come back into that arrangement at another time without that ordinary composite existing as a result. Since necessitarianism entails that it must exist if its parts are in that arrangement, the view is false."

the label “the grounding fact” for the conjunctive fact that the glass has these molecular properties and that the *R* laws obtain.

Leuenberger’s example is intended to demonstrate that although this grounding fact grounds the fragility of the glass in the actual world, it fails to ground this in some possible world. Thus the grounding relation between categorical properties and dispositional properties (at least in some cases) is contingent. More specifically, the grounding relation between categorical properties and dispositional properties is grounding relation for which weak bottom-up necessitation does not hold.⁸² And so, *GN* fails.

Here’s how the example works. Leuenberger suggests the possibility of a world *W* that is like the actual world in the respect that the objects and their properties at *W* are the same as the actual world. Further, the four fundamental forces of the actual world obtain at *W*. The fundamental forces thus act upon the properties of fundamental physical objects at *W* in the same ways that they do in the actual world such that molecules form and engage in molecular bonding. However, imagine that *W* differs from the actual world in the respect that an additional fundamental force obtains at *W*, the “*Z* force,” which is governed by the “*Z* law.” The suggestion is that the *Z* force prevents the forces governed by the *R* laws from generating fragility at *W*. That is, the *Z* force prevents the *R*-law-governed forces from acting upon a glass’s molecular properties in the way needed to generate a glass’s fragility.

So, although the grounding fact obtains in this possible world, the *Z* law “blocks” it from grounding the fact that the glass is fragile.⁸³ Thus, because of this difference in laws and forces

⁸² That is, the grounding relation in the example is such that *X* grounds *Y* at some possible worlds, though *X* obtains at other possible worlds where *Y* does not obtain.

⁸³ As Leuenberger (ibid., 162) describes the case: “Suppose that in world *w*₅, there is a fifth fundamental force, associated with an alien property whose bearers attract each other. While the corresponding law of *w*₅ is not a law of the actual world, all actual laws are also laws in *w*₅—such as the laws linking mass to the gravitational force, electric charge to the electromagnetic forces, color charge to the strong nuclear force, as well as the laws relating forces to motion. In *w*₅,

between the actual world and \mathcal{W} , grounding relations between categorical properties and dispositional properties that obtain in the actual world do not obtain at \mathcal{W} . So, the contingency of grounding relations between some categorical property and dispositional properties and *GN* is refuted.

It's worth quickly addressing how an advocate of *GN* might respond to this kind of counterexample. Such an advocate might tailor their formulation of grounding's metaphysical necessity to avoid this kind of counterexample. The strategy for combating *GN* which underlies Leuenberger's counterexample is this: for some instance of *X* grounding *Y*, construct a possible world \mathcal{W} at which *X* obtains and at which some fact *Z* obtains that will prevent *X* from grounding *Y* at \mathcal{W} . Thus, his strategy relies on positing "preventative facts": facts of the kind that *Z* is, that is, facts that prevent a grounded entity from obtaining in virtue of its grounds.

To overcome Leuenberger's strategy, the advocate of *GN* might stipulate that the necessity between grounds and grounded is not just weak bottom-up necessitation: it is not merely the case that if *X* grounds *Y*, then *Y* obtains at all possible worlds where *X* obtains. The advocate of *GN* could add a condition to their formulation of this necessity to avoid Leuenberger's strategy as follows: if *X* grounds *Y*, then *Y* obtains at all possible worlds where *X* obtains *and where there are no preventative facts that hold which would prevent X from grounding Y*. Call this "prevention-safe" necessitation.

To respond this, I reiterate that the purpose of appealing to this example for the broader discussion at hand is to argue that the modal profile of grounding does not differ from the modal profile of causation. The problem with this response to Leuenberger's strategy, at least for my purposes, is that if this response holds, then the modal profiles of grounding and causation will not

the glass *g* is in many respects just like it is in the actual world. Its parts are exactly the same with respects to the bearers of actual fundamental forces. However, the parts instantiate the alien property in w_5 , in such a way that it would not break if struck."

differ. For the necessitation relation between grounds and grounded, as it formulated in this altered presentation, would turn out to hold between causes and effects. This is because prevention-safe necessitation holds between any given cause and its effect. To show this let's ask: if C causes E , then what is that stands in the way of C causing E at other possible worlds where C obtains? There are many facts which might stand in the way. For example, perhaps the causal law " L " by which C causes E does not obtain at a possible world \mathcal{W} where C obtains. Or, perhaps law L *does* obtain at \mathcal{W} but what failed to obtain at \mathcal{W} was a causally-relevant background condition needed for C to cause E (e.g. a match was struck but the room did not contain enough oxygen for the match to ignite).

Notice that any fact of this sort which stands in the way of C causing E is a fact which plays the same role for causation that a preventive fact plays for grounding. For if C obtains at a possible world \mathcal{W} where the fact F also obtains such that relevant causal law L does not hold, then C fails to cause E at \mathcal{W} due to F obtaining. Or, say that C obtains at \mathcal{W} along with the fact F^* such that a necessary background condition does not hold, that is, a causally-relevant background needed for X to cause Y . For instance, say a match was struck but the room it was struck in did contain enough oxygen for the match to ignite. In this case, C fails to cause E at \mathcal{W} due to F^* obtaining.

Notice that C *would* cause E in the absence of any of these facts which would stand in the way of C causing E : "*causal preventative facts*." Stating the point more generally, for any given cause C and its effect E , C would cause E at all possible world where no causal preventative facts hold which would prevent C from causing E . The point is, that this modal connection between causes and effects is *prevention-safe necessitation*.

So, the crucial problem with the relevant response to Leuenberger's strategy, relevant to the purposes here at least, is that it this would fail to attribute to grounding a modal profile which

causation lacks. And this means that this response would fail to support the argument from modal profile.

Counterexample 4: Physical State to Mental State Grounding

What is often called the “zombie argument” against physicalism⁸⁴ relies on the appeal to an example of contingent grounding. The example is the possibility of beings who have no phenomenal consciousness but who are physically identical to actually existing beings who do: “zombies,” as they’re often called. Thus, if physicalism is understood as the view that the physical facts ground the mental facts with metaphysical necessity, then physicalism is refuted by the possibility of zombies. This is because the possibility of zombies demonstrates that the grounding relation between the mental and physical fails to obtain at all possible worlds. For the possible worlds that contain zombies are worlds at which some mental facts fail to obtain even though what *does* obtain at these possible worlds are the physical facts which ground the relevant mental facts at other possible worlds. Hence the conclusion: the physical does not necessitate the mental. And to be clear, the broader implication of the possibility of zombies which connects to the discussion at hand is that the possibility of zombies refutes *GN*. For the contingency of the grounding relation between physical facts to mental facts is a counterexample to *GN*, since this is a grounding relation for which weak bottom-up necessitation does not hold.⁸⁵

Since my views about the possibility of zombies are unsettled, I choose to remain neutral about this potential counterexample to *GN*. Nonetheless this example is worth noting since it demonstrates the breadth of potential examples available to the critics of *GN*.⁸⁶ Further, the example

⁸⁴ What is perhaps the most famous discussion of this argument is Chalmers (1997), chapters 3 and 4.

⁸⁵ That is, the grounding relation in the example is such that *X* grounds *Y* at some possible worlds, though *X* obtains at other possible worlds where *Y* does not obtain.

⁸⁶ For a discussion that explicitly appeals to the example of zombies in order to reject *GN*, see Leuenberger (2013, section 2.1).

ought to be noted because it concerns an extremely prominent fixture of recent philosophical literature; i.e. the possibility of zombies. Since the possibility of zombies has been the subject of so much attention, the counterexample to *GN* presented by this possibility might perhaps be considered one of the most significant points of dispute concerning *GN*'s plausibility.

There is an extensive thread of publications devoted to exploring the plausibility and implausibility of the possibility of zombies,⁸⁷ so deciding on one's view about whether this is a genuine possibility is a hugely daunting task. Here I only wish to note that *if* one endorses or at least takes seriously the possibility of zombies then one has reasons to reject or at least doubt *GN*. Or to put it differently, I wish to note that if one endorses *GN*, then one bears the onus of combating the variety of arguments in favor of the possibility of zombies.

To now conclude this section, since such counterexamples demonstrate that *GN* does not hold, the argument profile fails. More broadly, as I suggest, the purported difference between causation and grounding regarding modal profile fails to provide a stable argumentative basis for affirming the distinction between these relations.

3.3. The Instability of a Difference Regarding Corresponding Laws

The distinction between causation and grounding is sometimes framed in terms of a distinction between the laws which these relations correspond to. On this line of thought, causal relations hold as a matter of laws of one sort, whereas grounding relations hold as a matter of laws of another sort. Therefore, this difference regarding the corresponding laws of the relations is what the relations are distinct in virtue of.

⁸⁷ For an overview of the relevant literature and the topic of zombies, see Kirk (2015).

This line of thought was briefly discussed in chapter 2 while addressing A. Wilson's view, for his view employs this way of distinguishing between distinguishing between causation and grounding: in his terms, the distinction between nomological causation and metaphysical causation is a difference between causal relations which hold as a matter of nomological laws and causal relations which hold as a matter of metaphysical laws.⁸⁸ And since the modal strengths which are most commonly attributed to the laws of causation and groundings are the modal strengths which A. Wilson attributes to them, I will address this line of thought as he presents it: such that the laws of causation are nomological and the laws of grounding are metaphysical, rather than vice versa.

The problem with this way of distinguishing between the relations is likely to be obvious: this line of thought relies on *GN*. This is because the claim that grounding corresponds to metaphysical laws is tantamount to or entails the claim that grounding is metaphysically necessary. Or to present the point differently, the problem with this line of thought is that it is either very similar or identical to the argument from modal profile: framing the distinction between causation and grounding in terms of a difference in corresponding nomological and metaphysical laws respectively is tantamount to the framing the distinction as the argument from modal profile framed the distinction. That is, it is tantamount to framing the distinction in terms of the nomological necessity of causation and the metaphysical necessity of grounding.

Thus, the previously discussed criticisms of *GN* and the argument from modal profile also serve as criticisms of this line of thought on which the relations are distinct in virtue of this difference in corresponding laws.⁸⁹ So, it being false that there is a difference between the relations

⁸⁸ To reiterate his preferred way of articulating the point, A. Wilson (Forthcoming, 10) says that nomological causal relations are "mediated by laws of nature," whereas metaphysical causal relations are "mediated by principles of logic or metaphysics."

⁸⁹ Hence, the *integration* of purported difference between relations regarding modal profile and the purported difference between the relations regarding corresponding laws.

regarding corresponding laws is entailed by it being false that there is a difference between them regarding modal profile. Hence the point that these purported differences are *argumentatively integrated*.

So, as I suggest, the purported difference between causation and grounding regarding corresponding laws fails to provide a stable argumentative basis for affirming the distinction between these relations.

3.4. The Instability of a Difference in Regarding a Connection to Essence

Another purported difference between causation and grounding concerns *essences*, or more specifically, how grounding is sometimes thought to be connected to essences. Thus far, the discussion has been silent to the theme of essence. By doing so, the discussion thus portrayed grounding relations such that if X grounds Y , then the grounding relation which obtains between X and Y has nothing to do the essences of X or Y . However, on the view I will call “grounding essentialism” or “essentialism” for short, this portrayal of grounding is a false portrayal. According to essentialism, grounding relations are inextricably tied to the essences of the entities which grounding relations take as their relata.

To outline how essentialism views the connection between grounding and essences, it will be helpful to first offer an illustrative case. Let’s return to the example of knowledge being grounded by *JTB*. To set up the example such that it can illustrate the needed point, let’s assume that it’s essential to knowledge or it is *in* the essence of knowledge such that if an agent possesses *JTB* that P holds, then the agent has knowledge that P holds. So, two points are to be noted about this example. Firstly, in the sense that an agent’s state of knowledge that P holds is a state which obtains *in virtue of* the agent’s *JTB* that P holds, it can be said that an agent’s state of knowledge that P holds *is grounded*

by the agent's state of *JTB* that *P* holds. Secondly, as it was stipulated, the example was to be understood such an agent's state of knowledge that *P* holds is a state which obtains *in virtue of* the agent's *JTB* that *P* holds *due to this being essential to knowledge*.

So the entities in this example—the given state of knowledge and the given state of *JTB*—bear a grounding relation *because* of the essence of the kind of thing that the grounded entity is: the agent's given state of knowledge is grounded by the agent's relevant state of *JTB* *because it is in the essence of knowledge such that knowledge obtains in virtue of JTB*. Thus, the agent's states of *JTB* and knowledge bear a grounding relation *R*, and they bear *R* due to the essence of the kind of thing which the grounded entity is: a state of *knowledge*. Generalizing this, we get the sort of connection between grounding and essence as it is understood by the essentialist: on essentialism, grounding relations are “essence-based,” as I will describe it, meaning that grounding relations obtain due to the essences of—i.e. due to what is essential to—the entities which grounding relations take as their *relata*.

However, essentialists are not in agreement about some of the basic details concerning this connection. As suggested by how this example of knowledge was presented, one might think a given grounding relation *R* between *X* and *Y* obtains due to *just* the essence of the kind of thing that the grounded entity *Y* is, rather than *R* obtaining *also* due to the essence of the kind of thing that the grounding entity *X* is. Essentialism is endorsed in each of these flavors: some essentialists hold that a given grounding relation *R* between *X* and *Y* obtains due to *just* the essence of the kind of thing that the grounded entity *Y*⁹⁰ is, whereas other essentialists hold that *R* obtains due to the essence of the kind of thing that the grounding entity *X* is *and* due to the essence of the kind of thing that the

⁹⁰ For instance, this is how Fine (2012) frames his preferred version of grounding essentialism.

grounded entity Y is.⁹¹ Despite this difference, essentialist commonly abide by the foundational idea that essentialism is based upon: the idea that grounding relations are essence-based and thus obtain due to essences.⁹² Or as we might put the foundational idea of essentialism, in the sense that grounding relations obtain because of essences, essences serve as the *source* from which grounding relations arise. Thus, as essentialism portrays grounding, it would seem that grounding relations are themselves *grounded* entities: in the sense that grounding relations obtain in virtue of essences, grounding relations are grounded by essences.

Thus we have the inextricable tie between essence and grounding as it is understood by essentialism. And crucially for the challenge below, essentialism has it that grounding is essence-based *in every case*: for all grounding relations, if X grounds Y then these entities bear this grounding relation because this is essential to the kind of thing X or Y is or because it is essential to both the kinds of things that X and Y are.

Now, presumably, causation does not obtain in virtue of essences. For as it would seem, an event X can cause an event Y without the causal relation between X and Y having anything to do with essence. For instance, if my hand knocking into my coffee mug causes the mug to fall over, these events being causally related does not seem to hold due to the essence of my hand, or the essence of mug, or the essence of *anything*. So, we have identified yet another potential difference between causation and grounding which can be used to uphold the distinction between the relations. To challenge this purported difference, I will first call attention to counterexamples: examples of grounding relations which are non-essence-based. I will then propose a more general refutation of essentialism.

⁹¹ For instance, this is how Rosen (2010) frames his preferred version of grounding essentialism.

⁹² Others who endorse grounding essentialism include Dasgupta (2014) and Trogdon (2013b).

In chapter 2, I appealed to accidental generalizations as a basis for proposing *the argument from explanation* in favor of *GCI*. Accidental generalizations will now serve my argumentative purposes once again, for they can be used as a basis for refuting essentialism. The relevant point about accidental generalizations is the following: although accidental generalizations are grounded by their instances, the obtaining of the grounding relation *R* between an accidental generalization and its instances does not hold due to the essences of *R*'s relata—or the essences *any* entities whatsoever. Thus, the grounding relations between accidental generalizations and their instances are counterexamples to essentialism, for they are grounding relations which are non-essence-based.

To illustrate, let's consider again the accidental generalization that I discussed in chapter 2: the accidental generalization that all cats are located on Earth. As before, say that *N* is the number of cats that there actually are. The fact *FC* that all cats are on Earth is grounded by the fact that there are *N* cats on Earth and the fact that *N* cats are all of the cats that there are. And as it would seem, essences play no role in the obtaining of the grounding relation between *FC* and its grounds: the fact that all cats are located on Earth does not seem to obtain in virtue of the essences of any of the entities or facts involved in this example of grounding. For it is not essential to any cat or plurality of cats that this regularity holds, and it is not essential to the fact that there are *N* cats on Earth that this regularity holds, and so on. Hence, there does not seem to be *anything* for which it is essential that this regularity holds. And, as I pointed out when discussing this example in chapter 2, *countless* accidental generalizations work the same way: countless accidental generalizations can be conceived which are grounded by their instances, but which are not grounded by their instances due to the essence of anything.⁹³ Thus, essentialism fails. For there are non-essence-based grounding relations.

⁹³ Recall my other example: the accidental generalization that all my socks are located in my sock drawer. Like the example concerning cats, the generalization that my socks are all located in my sock drawer is grounded by its

To now offer a more general refutation of essentialism, I point out that the falsity of *GN* entails the falsity of essentialism. In this respect, the purported difference between the relations regarding modal profile and the purported difference regarding connection to essence are argumentatively integrated.

It is uncontroversial that what holds of an entity essentially holds with metaphysical necessity. And this means that if grounding relations are essence-based, and thus hold due to essences of the relata of grounding, then grounding relations must hold with metaphysical necessity: if *X* grounds *Y* and the grounding relation between them holds due to the essence of *X* and / or *Y*, then *X* and *Y* do not come apart across possible worlds. For instance, if indeed knowledge is grounded by *JTB* and this is the case due to the essence of knowledge, then knowledge and *JTB* do not come apart across possible worlds.

In section 3.2, it was established that grounding is contingent in some cases, and thus, grounds and grounded *can* come apart across possible worlds. This entails that essentialism is false, since essentialism entails that grounding is not contingent in any cases. Or putting it differently, it being false that there is a difference between the relations regarding connection to essence is entailed by it being false that there is a difference between them regarding modal profile. Hence the point that these purported differences are *argumentatively integrated*.

So, as I suggest, the purported difference between causation and grounding regarding a connection to essence fails to provide a stable argumentative basis for affirming the distinction between these relations.

instances: the particular facts about where each of my socks is located. But, this generalization is not grounded by these facts due to anything's essence.

3.5. The Instability of a Difference Regarding Ontological Non-Addition

As Sider (2015) summarizes the notion of some entities or facts being *nothing over and above* others as follows:

“Nothing over and above” is a flexible piece of philosophical rhetoric, applicable across a variety of situations and to entities of various categories. A fact might be said to be nothing over and above another when it is necessitated or grounded by the latter fact; a property might be said to be nothing over and above another when it is realized by the latter property; one might say that wholes are qualitatively nothing over and above their parts meaning that composite objects possess no ‘emergent’ properties; and so on. (1)

As vague and elusive as it is, the notion of the nothing-over-and-above relation persistently reoccurs in the philosophical literature of the past several decades, sometimes spoken off via the use of other phrases such as “ontological free lunch” or “no addition to being.”⁹⁴ Typically, when the nothing-over-and-above-relation is mentioned philosophical discourse, it is mentioned for the purpose of framing a philosophical view about some other phenomenon in terms of this relation. For example, as Varzi (2014, 47) frames “composition as identity,” a view concerning material composition, he characterizes it “broadly and loosely” as the view that “a composite whole is *nothing over and above* its parts.”

I will call this relation “ontological non-addition” or just “non-addition” for short. Further, if *Y* is nothing over and above *X*, I will say that the relation between *Y* and *X* is “*non-additive*.” If *Y* is something over and above *X*, the relation between them I will call “*additive*.”

⁹⁴ The phrases “ontological free lunch” and “no addition to being,” if I am not mistaken, are most known for their use in various works of David Armstrong. For instance, see Armstrong (1989) and (1997). Although the phrase “nothing over and above” also appears in various works of Armstrong I believe this phrase has a longer and richer literary lineage; one of which is historically vague in its origins. The phrase “something over and above,” which perhaps should be understood as the converse of “nothing over and above,” appears as early as 1912 in the first edition of Bertrand Russell’s *The Problems of Philosophy*, chapter 3.

Now to the point: many examples of grounding relations appear to be non-additive. The account of universals offered by Armstrong (1989, 1997) is a nicely illustrative case. On Armstrong's account, universals are not entities in their own right. A universal is an "abstraction" of what Armstrong calls a "states of affairs," the unified whole of a particular instantiating a universal.⁹⁵ As Armstrong (1997) puts it: "[A] universal is a gutted state of affairs; it is everything that is left in the state of affairs after the particular particulars involved in the states affairs have been abstracted away in thought" (28-29). On his account, because a universal is an abstraction it's incorrect to say that a universal is something strictly distinct from the states of affairs to which it belongs. As such, universals are *nothing over and above* states of affairs in which universals are grounded.

Other examples of grounding that would appear to be non-additive include the following. The truth of a conjunctive proposition might be considered nothing over and above the truth of the conjuncts upon which it is grounded. On a mathematical structuralist view of numbers, a given number's identity is thought to be grounded by its location within a mathematical structure. As such, a number's identity might be considered nothing over and above a number's location within a mathematical structure. And if one holds that mental states are nothing over and above functional states and mental states are grounded by functional states, these grounding relations would appear to be non-additive.⁹⁶

⁹⁵ More carefully, a particular instantiating a universal is the most basic kind of state of affairs. This is what Armstrong calls an "atomic" state of affairs. More complex states of affairs, "molecular" states of affairs, involve a plurality of universals and / or particulars.

⁹⁶ And in fact, physicalism /materialism about mentality is sometimes characterized in terms of non-addition. For example, As Melnyk (2012, 281) notes: "Intuitively, materialism says that a person's mental states are *nothing over and above* his or her material states, while dualism denies this."

So in light of these examples just discussed, there is good reason to think that grounding is non-additive, meaning: if X grounds Y , then Y is nothing over and above X .⁹⁷ In contrast, causation would appear to be additive, meaning if X causes Y , then Y is something over and above X . For effects would appear to be some addition to the being of, or entirely distinct from, their causes. To illustrate, the event of a bomb exploding would appear to be an addition to being of, or something distinct from, the event of the bomb detonating. So if one were to indeed hold that grounding is *non-additive* and causation is *additive*, this implies what I will call the “argument from non-addition”:

Premise 1: Causation is additive (that is, if X causes Y then Y is something over and above X).

Premise 2: Grounding is non-additive (that is, if X grounds Y then Y is nothing over and above X).

Conclusion: Causation is distinct from grounding.⁹⁸

To challenge the argument, I propose that premise 2 is subject to counterexamples. That is, there are cases of grounding in which the grounded facts or entities are strictly distinct from and thus something over and above their grounds.

⁹⁷ Further, the idea that grounding is non-additive seems to have been vaguely present in the relevant literature for some time, though it is rarely focused upon or carefully discussed at any length. For it is not uncommon for grounding theorists to briefly and loosely offer remarks that suggest or hint at the idea that grounding is non-additive. For instance, Fine (2001, 15-16) appears to gesture at this idea when he says “...we are not inclined to think of the truth of a grounded proposition as a *further fact* over and above its grounds...” Similarly, Rosen (2010, footnote 8, p.118) suggests that grounded entities and their grounds are not “wholly distinct.” And Schaffer (2015, 47) explicitly endorses Rosen’s suggestion just mentioned and Schaffer builds upon it, thus proclaiming that “grounding connects indistinct entities.” In the quote above from Sider (2015, 1), Sider states: “A fact might be said to be nothing over and above another when it is necessitated or grounded by the latter fact.” And perhaps most notably, while outlining how grounding is typically understood, Wilson (2014, 543) speaks as if it’s a standard assumption among grounding theorists that grounded entities are “nothing over and above” their grounds.

⁹⁸ Rosen (2010, footnote 8) comes very close to explicitly proposing this argument.

To make the counterexamples more compelling, it will help to offer a simple yet clear way of characterization non-addition. If a characterization can be proposed which seems to successfully capture something about non-addition, the given characterization will provide a more nuanced way to think about and assess the examples.

As mentioned above, non-addition is sometimes spoken of by the phrase “ontological free lunch,” coined by David Armstrong. And with this phrase, he suggested a way of characterizing non-addition in terms of a shared *ontological commitment* between entities. This characterization harnesses the rough idea that what it is for the *Ys* to be nothing over and above the *Xs* is, in some sense, for the *Ys* to be *indistinct* from *Xs*. Since the *Ys* are indistinct from the *Xs*, Armstrong’s thought was that positing the existence of the *Ys* should not require an ontological commitment distinct from the ontological commitment to the *Xs*. That is, if the *Ys* are nothing over and above the *Xs*, then the commitment to the *Xs* suffices for positing *both* the *Xs* and the *Ys*. Hence, the *Ys* are an *ontological free lunch*: if you “buy” the existence of *Xs*, meaning that you posit them by accepting the ontological commitment to them, you get the *Ys* “for free”. In this way, Armstrong used the notion of ontological commitment to characterize non-addition. To articulate claims about non-addition in terms of this characterization, if the *Ys* are nothing over and above the *Xs*, I will say that the *Xs* “*commitment-suffice*” for the *Ys*.

To demonstrate the plausibility of the *commitment-sufficing* characterization of non-addition, let’s note how intuitively it captures examples of non-addition. If we understand physicalism as the view that mental states are nothing over and above physical states, then it would be the case that positing mental states requires no ontological commitment beyond the commitment to the physical states which they are nothing over and above. And indeed, this seems right. For it does seem that the dualist who denies physicalism must hold that mental states are something over and above brain

states. And this would indeed seem to entail that positing both the physical and the mental would require distinct ontological commitment, since the physical and the mental are fundamentally distinct. That is, it seems natural to say that the dualist would or should hold the physical does not commitment-suffice for mentality. And considering the physicalist who denies that the mental is fundamentally distinct from the physical, it does seem that she should hold that accepting ontological commitment to the physical is sufficient for the physical. Hence, commitment-sufficing would seem to get something quite right about non-addition.

With this characterizing of non-addition as our aid, let's now consider counterexamples to the claim that grounded entities are nothing over and above their grounds.

Counterexample 1: Sets and Set Members

Prima facie, sets are strictly distinct from, and thus are *something over and above*, their members.

Though, sets are grounded by their members, as it is commonly said. To illustrate with the famous example of grounding which comes from Fine (1994), Socrates grounds the singleton S which contains Socrates and yet, S something over and above Socrates.

This is a compelling counterexample independently of using the commitment-sufficing characterization, since S is an abstract entity whereas Socrates is a concrete entity. Since one is abstract and the other is concrete, it is quite difficult to make clear sense of the idea that somehow these entities are indistinct in some way. So, this example seems to very strongly undermine premise 2 of the argument from non-addition.

Nonetheless, the counterexample can be made even more compelling by appeal to the commitment-sufficing characterization of non-addition. It is quite a stretch of plausibility to think that accepting the ontological commitment to Socrates, and Socrates only, is sufficient for positing Socrates and the singleton S . It seems difficult to deny that positing these two entities requires

entirely distinct ontological commitments. This reinforces the thought that these entities are entirely distinct and thus, S is grounded by Socrates though S bears no relation of non-addition to Socrates. Or said differently, since the singleton is not an ontological free lunch, it is not nothing over and above its grounds.

Counterexample 2: Properties of Set Members and the Properties of Sets

Say that F_1 is the fact that my desk has a rectangular shape. Say S^* is the singleton that contains my desk. And say F_2 is the fact that S^* has a member which is rectangular. As banal and contrived as the example is, the example plays the needed role. For this can quite naturally be considered a case of grounding without non-addition. To point out why there seems to a grounding relation between F_1 and F_2 , notice that F_2 obtains in virtue of F_1 since S^* has a member which is rectangular (i.e. F_2) by virtue of the desk being rectangular (i.e. F_1). And to point out the lack of nothing-over-and-above-ness between F_1 and F_2 , notice that these facts have completely different constituents. For their constituent *particulars* are distinct, i.e. the desk and S^* , and their constituents *properties* are distinct, i.e. rectangularity and the property of having a member which is rectangular. So, if facts are individuated by their constituents, F_1 and F_2 are entirely distinct.

Further, the counterexample can be made more compelling by appeal to the commitment-sufficing characterization of non-addition. Since F_1 and F_2 have distinct constituents, it would seem that accepting the ontological commitment to either of them is not sufficient for positing both of them. Prima facie, positing these two entities requires entirely distinct ontological commitments. This reinforces the thought that these entities are entirely distinct and thus, F_2 is grounded by F_1 though F_2 bears no relation of non-addition to F_1 . Or said differently, since F_2 is not an ontological free lunch, it is not nothing over and above its grounds.

Counterexample 3: Truths and Truthmakers

Assuming a non-deflationary account of truth, truthmaking would appear to be a species of grounding which is additive. To illustrate, the truth of the proposition “Obama exists” is grounded by the fact that Obama exists. Yet, *prima facie*, the truth of this proposition is something over and above the existence of Obama. And to frame the counterexample in terms of commitment-sufficing: *prima facie*, accepting the ontological commitment to Obama would seem to have nothing to do with proposition and truth. So, positing the fact that “Obama exists” is true would seem to require an entirely different ontological commitment than the commitment to Obama. Thus, the entities in the example have distinct ontological commitments, and this precludes there being a commitment-sufficing relation between them. So the truth of “Obama exists” is grounded by, but it is something over and above, the existence of Obama. Said differently, since “Obama exists” is not an ontological free lunch, it is not nothing over and above its grounds. The grounding relation is thus *additive* in this case.

In light of such examples, I propose that grounding is not non-additive in all cases, so the argument from non-addition fails. Hence, the purported difference between causation and grounding regarding ontological non-addition fails to provide a stable argumentative basis for affirming the distinction between these relations.

3.6. The Instability of a Difference Regarding Superinternality

3.6.A. The Argument from Superinternality

What I will call the “argument from superinternality” is that which Schaffer (2015) presents below:

... [A reason for treating causation and grounding as distinct is that] causation connects distinct events but grounding connects indistinct entities. Causation is thus an external relation while grounding is an internal relation. Indeed grounding is what K. Bennett (2011, 32) calls a superinternal relation: fixing the intrinsic nature of the grounding side of the relation alone guarantees that the grounded side exists, has the intrinsic nature that it does, and is grounded in that way. On this point I agree with Rosen (2010, 118) who finds it ‘more

natural to keep causal relations on one side—as external relations among wholly distinct states of affairs—and grounding relations on the other.’ (36)

Presented formally, the argument is this:

Premise 1: Causation is superinternal in no cases.

Premise 2: Grounding is superinternal in all cases.

Conclusion: Causation is distinct from grounding.

Call “grounding superinternalism” the view on which premise 2 is true. I’ll dispute the argument from superinternality by arguing against this view and thus against premise 2. First, in order to make this view and my criticisms of it clear, I’ll clarify the notion of superinternality itself.

The notion of *superinternality* is a modification of the notion of *internality*. Internality is a relation’s status such that it is an *internal* relation, which contrasts with the status of being an *external* relation. The distinction between internal and external relations is nicely described in Armstrong (1989):

A relation is internal... when given certain terms with certain natures, the relation must hold between the terms. It holds in ‘every possible world’ that contains these terms and where these terms have these natures. Given the numbers 4 and 2 as terms, then it follows, given the nature of 4 and 2, that they stand in the relation of greater and less than. ‘4 is greater than 2’ therefore expresses an internal relation holding between these numbers. Contrast this with the case where *a* is a mile distant from *b*. In general the existence of *a* and the *b* and their natures fail to ensure that *a* is a mile distant from *b*. It is a contingent matter, not holding in every possible world, that *a* is a mile from *b*. (43)

Armstrong’s formulation of internality thus presents the idea that a given relation, *R*, is internal if the “source” of *R* obtaining, as we might say, is the nature of the relata that flank both sides of *R*: given the nature of some entity *E*₁ and given the nature of another entity *E*₂, *R* obtains between *E*₁ and *E*₂. By modifying this notion of internality in two ways, Bennett (2011) had thus proposed the notion of *superinternality*. These two modifications are as follows. Firstly, *R* is superinternal if *R*

obtains between entities E_1 and E_2 in virtue of the nature of just *one* of these relata (whereas if R were *internal* rather than *superinternal* then R would obtain in virtue of the nature of *both* the relata).

Secondly, the nature of the relatum which serves to make R obtain does not *only* serve to make R obtain. It also serves to make it the case that the other relatum exists and has the nature that this other relatum has. As Bennett (2011, 9) puts it: “[a] superinternal relation is one such that the intrinsic nature of only one of the relata—or, better, one side of the relation—guarantees not only that the relation holds, but also that the other relatum... exists and has the intrinsic nature it does.”

Further, Bennett (2011) proposes that *grounding* is a superinternal relation. What this claim amounts to is the following. Say that some entity E_1 grounds entity E_2 . “Fixing” the nature of E_1 fixes the existence and the nature of E_2 and it fixes the fact that the grounding relation obtains between E_1 and E_2 : “[t]he superinternality of grounding means that the minimal supervenience base for its obtaining on a particular occasion is the existence and intrinsic nature of the [relatum on one side of the relation]” (ibid., 10). Bennet illustrates this with the example of physicalism, construed as the view that the mental is grounded in the physical:

No physicalist is going to say that the grounding relation holds between the physical and the mental in virtue of the intrinsic nature of both relata, because they are not going to say that the intrinsic nature of the mental facts is part of what makes it the case that the physical facts ground them. Rather, physicalists will say that the physical facts make it the case that the mental facts are what they are, have the intrinsic natures they do. They will say that it all unfolds ‘upwards’ from the physical. Both the less fundamental facts and the relation that generates them derive from the more fundamental facts. (ibid., 9)

Now, with the notion of superinternality having been elaborated, not only can Schaffer’s argument that works by appeal to this notion can be better understood, but my criticisms can be clearly formulated.

3.6.B. The Problem of Indistinctness

My first criticism will focus on Schaffer's suggestion that "grounding connects indistinct entities." Thus grounding superinternalism entails the claim that I will call "consequence 1," which runs as follows: part of what it amounts to for grounding to be superinternal is the fact that, for all grounding relations, if X grounds Y , then X and Y bear some sort of relation of indistinctness.

Call this relation of indistinctness that is associated with superinternality "superinternal indistinctness." It may appear that the relation that I had earlier called "non-addition" is the very same as the relation of superinternal indistinctness. Because of this, consequence 1 might appear to be no different than the claim that all grounded entities are *nothing over and above* grounding entities (and thus grounding is non-additive in all cases).

In section 3.5, I raised numerous counterexamples against the claim that all grounding relations are non-additive. So if non-addition is equated with superinternal indistinctness, and thus consequence 1 is equated with the claim that all grounding relations are non-additive, then consequence 1 is subject to those same counterexamples. So then, grounding superinternalism would turn out to be false, for it entails a false consequence.

However, Schaffer has indicated in personal communication that he does *not* intend for the relation of superinternal indistinctness to be considered one and the same as the relation as non-addition. His intended notion of indistinctness is that which is exclusively involved with cases in which entities not only bear an indistinctness relation to other entities, these relata *also* bear superinternal relations. In contrast, the relation I had called "non-addition" is a more wide-ranging notion of indistinctness that is broad enough to apply to *any* case in which some entities are considered nothing over and above others. Thus, non-addition and superinternal indistinctness come apart, and so consequence 1 is distinct from the claim that all grounding relations are non-additive.

Be that as it may, I propose that this does not safeguard consequence 1 from the counterexamples that I had raised against the claim that grounding is non-additive in all cases. Why? Well, those examples demonstrated that in some cases grounding does fail to involve non-addition *at all*. No relation of indistinctness *whatsoever* was involved in those examples of grounding. Therefore, those examples demonstrate that in some cases grounding does not involve any *specific kind* of non-addition, such as superinternal indistinctness.

So although consequence 1 is not identical with the claim that grounding is non-additive in all cases, it is nonetheless falsified by the counterexamples which I had raised in section 3.5. Or to put the point more simply, even if superinternal indistinctness is different from non-addition, still, whatever superinternal indistinctness amounts to, it is a relation which does not hold between entities that are strictly distinct. Thus, because those counterexamples show that grounding relations obtain between entities that *are* strictly distinct, those examples show that some grounding relations do not involve superinternal indistinctness.

To reinforce this point, I'll quickly reiterate a couple of those examples. The fact that a given set *S* exists is grounded by *but is strictly distinct from* the fact that *S*'s members exist. For instance, although the fact that Socrates exists grounds the fact that the singleton Socrates exists, the fact that Socrates exists is strictly distinct from the fact that the singleton exists. Likewise, a disposition is grounded by *but is strictly distinct from* its categorical basis.⁹⁹ For instance, being composed of sodium chloride serves as the grounds for *but is distinct from* the disposition of being water soluble.

⁹⁹ Perhaps some dispositions do not have any categorical grounds. This is a controversial issue in some of the literature concerning *dispositional essentialism*. For instance, Ellis (2010) argues that dispositions do not require a categorical basis. But, if it is presumed that at least *some* dispositions have a categorical basis, then the example is available in which a disposition is grounded by *but is distinct from* its categorical basis.

Thus, whatever this kind of indistinctness amounts to which is associated with superinternality, grounding superinternalism entails the false consequence that grounded entities and grounding entities bear this relation in all cases.

3.6.C. The Problem of Necessitation

In his description of the superinternal status of grounding, Schaffer says that “fixing the intrinsic nature of the grounding side of the relation alone guarantees that the grounded side exists, has the intrinsic nature that it does, and is grounded in that way.” Thus, he suggests that part of what it amounts to for grounding to be superinternal is that the obtaining of grounding entity *E* “guarantees” what the obtaining of what it grounds. If indeed this “guaranteeing” relation between grounds and grounded holds across all possible worlds, then this relation appears to be indistinguishable from the relation of *weak bottom-up necessitation*. Thus, grounding superinternalism seems to entail what I will call “consequence 2”: the claim that grounding entities necessitate what they ground, such that this necessitation relation is of the weak bottom-up variety.

There is an obvious problem: endorsing consequence 2 is tantamount to endorsing *GN* (grounding necessitarianism). But as it was established in section 3.2, *GN* is false: grounds and grounded do not bear a weak bottom-up necessitation relation in all cases. So grounding superinternalism fails, for it entails a false consequence: it entails *GN*.

Due to these problems, I suggest that the argument from superinternality fails. More broadly, I suggest that the purported difference between causation and grounding regarding superinternality fails to provide a stable argumentative basis for affirming the distinction between these relations.

3.7. The Instability of a Difference Regarding Indeterminism

Schaffer (2015, 35) proposes that the distinction between grounding and causation is evidenced by the following difference: "... there can be indeterministic causation but not indeterministic grounding. (In indeterministic cases, fixing the causes does not fix the effect.)" I'll call this the "argument from indeterminism," and I'll call the claim that this argument relies on—Schaffer's claim that grounding is deterministic in all cases—"grounding determinism."¹⁰⁰ In order to challenge the argument, I'll propose three challenges to grounding determinism. As I will argue:

- There is no principled basis for grounding determinism.
- It being metaphysically possible that grounding is indeterministic is granted by a variety of common views about the limits of metaphysical possibility.
- There are counterexamples to grounding determinism.

To approach my first and second challenge to grounding determinism, let's consider the question: why think that grounding determinism is true? That is, why think that no grounding relation could be *indeterministic*? Schaffer (2015) is silent to this question, but it is not difficult to speculate how Schaffer might argue in favor of this view: by appeal to the premise that all standard examples of grounding are deterministic, one might inductively infer the conclusion that grounding is a strictly deterministic relation. This is certainly a plausible approach to the question concerning whether or not grounding can be indeterministic. But a deeper issue about this question concerns whether or not a principled basis for grounding determinism can be established. What I mean by a "principled

¹⁰⁰ Grounding determinism can be understood as the view that the following holds. In all cases of grounding, if the full grounds for some grounded fact F obtain (and no facts obtain which would prevent these full grounds from grounding F) then F could not fail to obtain. If the view is framed this way then the view that contrasts with grounding determinism is the view on which the following holds: if F 's full grounds obtain (and no facts obtain which would prevent these full grounds from grounding F), F could obtain and F could fail to obtain. Further, this way of framing these views can be made more robust by specifying probabilities that these views ascribe to F obtaining in virtue of its full grounds, such as follows. On grounding determinism, in all cases of grounding, if F 's full grounds obtain (and no facts obtain which would prevent these full grounds from grounding F) then F has a probability of 1 of obtaining. On the contrasting view, in at least some cases of grounding, if F 's full grounds obtain (and no facts obtain which would prevent these full grounds from grounding F) then F has a probability between 0 and 1 of obtaining.

basis” is this: if there are reasons to think that *as a matter of principle* grounding cannot be indeterministic, then there is a principled basis for grounding determinism. To show that there is no such principled basis, I will draw attention to various claims which might seem to provide a principled basis for this view and I will show that these claims fail to do so. So, as I will argue, since there is no principled basis for grounding determinism, the abundance of examples of deterministic grounding relations fails to decisively settle the matter. For if there is no principled basis for this view, then there is conceptual room to think that grounding can be indeterministic in some cases.

So, let’s consider a variety of claims which might provide a principled basis for grounding determinism. Firstly, perhaps one might argue that this view follows from the idea that grounding is metaphysically necessary in every case. This line of thought would run as follows. If X grounding Y entails that X necessitates Y , then it follows that if X obtains, X could not fail to ground Y . And so, the grounding relation between X and Y is deterministic. However, even if this line of thought is plausible, it fails to entail the claim that grounding must be deterministic in all cases. For as I had argued in section 3.2, there are cases of grounding which are contingent. Since there are cases in which grounding relations are contingent, grounding determinism cannot be established by appeal to the claim that all cases are metaphysically necessary.

Secondly, perhaps one might argue that grounding determinism follows from the idea that grounding is what I had called a *non-additive* relation. Recall that if grounding is non-additive, this means that a grounded fact or entity is nothing over and above its grounds. Conversely, if grounding is *additive*, this means that a grounded fact or entity is something over and above its grounds.

Why might it appear that grounding determinism follows from the idea that grounding is non-additive? If X grounding Y entails that Y is nothing over and above X , then it would seem that the following holds: if X obtains, X could not fail to ground Y , and thus the grounding relation

between X and Y is deterministic. This is because X being nothing over and Y would seem to ensure that X and Y could not come apart under any conditions whatsoever. And so it must hold with certainty (i.e. a probability of 1) that X and Y obtain together. However, even if this line of thought is plausible, it fails to entail the claim that grounding must be deterministic in all cases. For as I had argued in section 3.5, there are cases of grounding which are *additive*. Since there are cases in which grounding relations are additive, grounding determinism cannot be established by appeal to the claim that all cases of grounding are non-additive.

Thirdly, perhaps one might argue that grounding determinism follows from the view which I had called *grounding essentialism*: the view that all grounding relations are essence-based. Recall that on this view, if fact X grounds fact Y then it's in the essence of these facts or it's in the essence of the constituent entities of these facts such that X grounds Y . Why might grounding determinism seem to follow from grounding essentialism? Since fact X grounding fact Y is essential to X and Y or the constituent entities of these facts (as grounding essentialism holds), and since these facts or entities could not obtain without their essences, it follows that: if X obtains, then X could not fail to ground Y . Thus, if grounding essentialism holds, grounding relations would turn out to be deterministic.

However, even if this line of thought is plausible, it fails to entail the claim that grounding must be deterministic in all cases. For as I had argued in section 3.4, there are cases of grounding which are *non-essence-based*. Since there are cases of grounding which are non-essence-based, grounding determinism cannot be established by appeal to the claim that all grounding relations are essence-based.

Fourthly, it may seem that grounding determinism follows from the idea that grounding is superinternal in all cases. Recall Schaffer's following comment concerning what it amounts to for grounding to be superinternal: "fixing the intrinsic nature of the grounding side of the relation alone

guarantees that the grounded side exists, has the intrinsic nature that it does, and is grounded in that way” (2015, 36). His comment here seems to suggest that part of what it means for grounding to be superinternal is that grounding is deterministic: by saying that the nature of the facts or entities on the grounding side of a grounding relation “*guarantees*” that these facts or entities serve to ground what they ground, he seems to be suggesting that they could not fail to ground what they ground under any conditions.

However, even if this line of thought is plausible, it fails to entail the claim that grounding must be deterministic in all cases. For as I had argued in section 3.6, there are cases of grounding which are *not* superinternal. Since there are cases of grounding which are not superinternal, grounding determinism cannot be established by appeal to the claim that all cases of grounding *are* superinternal.

My second challenge to grounding determinism concerns the simple idea that it is metaphysically possible that grounding is indeterministic, or as I will say, the idea that grounding is “*possibly indeterministic*.” As I suggest, since grounding is possibly indeterministic, there are indeterministic grounding relations at some possible worlds. Thus, these indeterministic grounding relations at these possible worlds are counterexamples to grounding determinism (for grounding determinism holds that grounding is necessarily deterministic).

Before defending this argument, it will be helpful to first address an important issue about how the argument is intended to work. As one might think, if this argument is ultimately supposed to support *GCI*, then then this argument would have to support a stronger conclusion than that which it supports. As this line of thought would go, if *GCI* is true, then all causal relations are grounding relations. And this means that if *GCI* is true, then all tokens of causation in the actual world which are indeterministic would turn out to be grounding relations. So, if the argument were

to support *GCI*, then the argument would need to support the conclusion that grounding is indeterministic *in the actual world*. However, the argument supports only the weaker conclusion that grounding is indeterministic at non-actual worlds.

In response, I point out that although indeed the argument does not support the stronger conclusion just mentioned, the argument works to support *GCI* in a way that diffuses the relevant issue just mentioned. Since the argument shows that grounding is not necessarily deterministic, the argument shows that there are no modal restrictions imposed upon the actual world which prohibit grounding relations contained in the actual world from being indeterministic. Thus, since the argument shows that it is metaphysically possible that grounding is indeterministic, the argument shows that there is nothing to prevent the advocate of *GCI* from treating indeterministic causal relations in the actual world as indeterministic grounding relations.

Now, to argue that it's a plausible idea that grounding is possibly indeterministic, I suggest that this idea is supported by a variety of common views about how the restrictions on metaphysical possibility are determined. That is, it being metaphysically possible that grounding is indeterministic is granted by a variety of common views about what the limits of metaphysical possibility are and how these limits are imposed upon reality.

One common view of this kind is *combinatorialism*. This view comes in many versions; the general idea that they share is the idea that, as Menzel (2015, section 2.3) puts it, possibilities are “recombinations, or rearrangements, of certain metaphysical simples.” Different versions of this view vary with respect to what they consider the metaphysical simples to be. To simplify matters, I will sketch this view in terms of just one specific version of it: the version developed by Armstrong (1989, 1997). Roughly, Armstrong proposed that possibilities are to be understood as non-actual states of affairs which are rearrangements of the constituents of actual states of affairs. For instance,

the possibility of the Eiffel Tower being only five feet tall is accounted for on this view as follows. The property of being five feet tall, which is instantiated by entities *other than* the Eiffel Tower at the actual world, is modally combined with the Eiffel Tower to compose a state of affairs which obtains at a possible world. That is, at some possible world, a state of affairs, *S*, obtains which consists in the Eiffel Tower instantiating this property. The idea being that the possible state of affairs in question (i.e. the Eiffel Tower being five feet tall) consists in the combination of a particular and a property which are each constituents of distinct states of affairs at the actual world.¹⁰¹

Based on this idea, combinatorialism suggests that the laws concerning what can and cannot be modally recombined are the laws of metaphysical possibility: the so-called “principles of recombination.” Thus, this provides a conception of how the limits of metaphysical possibility are determined: what is and what is not metaphysically possible is determined by which constituents of states of affairs (i.e. which particulars and properties) can be modally separated and modally combined. To illustrate, since a proton would not be a proton unless it is positively charged, a proton cannot possess negative charge. Thus it would seem that a principle of recombination holds which prohibits protons from modally separating from the property of positive charge and which prohibits protons from modally combining with the property of negative charge.

Now, let’s ask: does combinatorialism conflict with the idea that grounding is possibly indeterministic? That is, if one thinks that modal recombination is what determines what is metaphysically possible, then would one have reason to think that it is metaphysically impossible that grounding is indeterministic? As far as I can tell, there is no reason for thinking that the answer is yes: there is no reason why combinatorialism would suggest that it is metaphysically impossible

¹⁰¹ Another crucial aspect of Armstrong’s view is such that he treats non-actual states of affairs as *fictional*, for he sought to offer a deflationary portrayal of the ontological status of non-actual possibilities. But because this aspect of his view is unimportant for the discussion at hand, I will leave this aside.

that grounding is indeterministic. This is because there is no reason to think that grounding is not modally combinable with the property of being indeterministic. Just as it's entirely plausible that a deterministic species of causation is modally combinable with the property of being indeterministic, the same holds for grounding. If one were to claim otherwise, the burden of proof would be on one's shoulders to say why grounding and the property of being indeterministic are not modally combinable. Since I do not think this burden can be met (without begging the question),¹⁰² I suggest that combinatorialism grants the claim that grounding is possibly indeterministic.

An alternative view of the limits of possibility, inspired by Fine (1994), is as follows. On the “neo-Aristotelean” conception of metaphysical necessity, what is necessary of an entity is determined by what it is essential to it. For instance, if Socrates is essentially human, then it is metaphysically necessary that he is human. This conception implies that what is metaphysically possible or impossible is determined by what is essential of a given entity or entities: since it is essential of Socrates that he is human, this makes it metaphysically *impossible* that he is an amphibian (assuming that it is metaphysically impossible that a human can be an amphibian). Further, since it is essential of Socrates that he is human, it is metaphysically *possible* that Socrates has a thousand fingers (given that his being human is independent of how many fingers he has). In this way, the neo-Aristotelean view of metaphysical necessity suggests that the restrictions on what is metaphysically possible are imposed by what is compatible with the essential facts or essential truths of what there is: a given state of affairs *S* about some entities is metaphysically impossible if *S* is not compatible with what is essential of those entities and *S* is metaphysically possible if *S* is compatible with what is essential of those entities.

¹⁰² One might insist that grounding and the property of being indeterministic are not modally combinable if one were to question-beggingly assume that grounding is necessarily deterministic.

Now, let's ask: does this neo-Aristotelean view conflict with the idea that grounding is possibly indeterministic? That is, if one thinks that what is essential of entities is what determines what is metaphysically possible, then would one have reason to think that it is metaphysically impossible that grounding is indeterministic? As far as I can tell, there is no reason to think that the answer is yes. For there is nothing essential of either grounding or the property of being indeterministic which makes grounding incompatible with instantiating this property. If one were to claim otherwise, the burden of proof would be on one's shoulders to say what is essential of grounding or this property which would explain such an incompatibility. Since I do not think this burden can be met, I suggest that this neo-Aristotelean view grants the claim that grounding is possibly indeterministic.

On a more simplistic but very commonly assumed view, the law of non-contradiction imposes restrictions on the limits of modal space. As Tahko (2009, 32) articulates the idea: "if there are any principles which constrain the structure of reality, then [the law of non-contradiction] is certainly our most likely candidate." For although the semantic or logical interpretation of the law of non-contradiction construes it as a principle about propositions or sentences (i.e. no two contradictory propositions or sentences can both be true), the metaphysical interpretation construes it as a principle about reality. To gloss the metaphysical interpretation, this suggests something along the following lines. What is reflected by the idea that P and $\neg P$ cannot both be true is that the worldly states of affairs which P and $\neg P$ represent are mutually exclusive: the states of affairs that P represents and the state of affairs that $\neg P$ represents cannot both obtain at the same possible worlds. Hence, the principle imposes a limit on what is metaphysically possible by prohibiting mutually exclusive states of affairs from obtaining at the same possible worlds.

Now, let's ask: does this law-of-non-contradiction-based view conflict with the idea that grounding is possibly indeterministic? That is, if one thinks that the law of non-contradiction determines what is metaphysically impossible, then would one have reason to think that it is metaphysically impossible that grounding is indeterministic? As far as I can tell, there is no reason for thinking that the answer is yes. My thought is this. There is no reason for thinking that it is contradictory to say that that grounding is indeterministic. And this being non-contradictory reflects the fact that no two mutually exclusive state of affairs are spoken of when it is said that grounding is indeterministic. Or to put the point more carefully, say that S is the state of affairs that grounding is indeterministic. Since it is not contradictory to say that grounding is indeterministic, therefore, if S obtains at a possible world W , then S does not obtain at W along with a mutually exclusive state of affairs. If one were to claim otherwise (i.e. that it is contradictory to say that grounding is indeterministic), the burden of proof would be on one's shoulders to provide some account of *why* it is contradictory to say that grounding is indeterministic. Since I do not think this burden can be met, I suggest that the law-of-non-contradiction-based view grants the claim that grounding is possibly indeterministic.

Further, philosophical discourse very commonly relies on the basic view that inconceivability entails impossibility. On this view (as it is typically presented), although the limits of conceivability do not *determine* limits of possibility, the limits of possibility can be *discerned* by recognizing what is inconceivable.¹⁰³ This is the basic idea which underlies *inconceivability arguments*: arguments in which a given claim C is refuted by showing that C fails to describe a conceivable state of affairs S . As the style of argument goes, since S is inconceivable, it is unacceptable that S is metaphysically possible.

¹⁰³ For extensive discussion of this view, related views, and the connection between conceivability and possibility, see Gendler and Hawthorne (2002).

Therefore, *C* is unacceptable.¹⁰⁴ The assumption that the style of argument relies is something to the effect that inconceivability epistemically tracks the limits of metaphysical possibility: what is inconceivable is not metaphysically possible.

Now, let's ask: does this inconceivability-based view conflict with the idea that grounding is possibly indeterministic? That is, if one thinks that what is inconceivable is not metaphysically possible, then would one have reason to think that it is metaphysically impossible that grounding is indeterministic? As far I can tell, the answer is no. For it is perfectly conceivable that grounding is indeterministic: I have no difficulty in imagining that some state of affairs obtains in which case there is probability between 0 and 1 that this state of affairs will ground another state of affairs. So, I suggest that this inconceivability-based view grants the claim that grounding is possibly indeterministic.

To conclude this second challenge to grounding determinism by emphasizing the basic point of this challenge, the point is this. Since a variety of the views concerning metaphysical impossibility are consistent with and supportive of the claim that grounding is possibly indeterministic, these views are consistent with and supportive of denying grounding determinism.

To present my third challenge to grounding determinism, I propose the following counterexamples to this view. Firstly, Leuenberger's counterexample to *GN* discussed above (in section 3.2) can be altered to serve as such a counterexample. To reiterate, the example worked as follows. Leuenberger describes a possible world *W* which is like the actual world in the respect that *W* contains the same fundamental forces, and these forces are governed by the same laws; the *R* laws. Further, *W* contains the same objects as the actual world and these objects possess the same

¹⁰⁴ This style of argument is used across a *huge* variety of literature-threads in philosophy, such as the literature-threads that concern physicalism about mentality (e.g. Kirk [2008]), freedom and determinism (e.g. Llewelyn [1966]), Kant's transcendental arguments (e.g. Mandt [1983]), and scientific realism (e.g. Rowbottom [Forthcoming]).

properties at \mathcal{W} that they possess in the actual world. However, \mathcal{W} is different than the actual world in the respect that the Z force obtains at \mathcal{W} , i.e. an additional fundamental force, which is governed by the Z law. As Leuenberger describes it, the Z force counteracts and thus prevents the R -law-governed forces from grounding what it is they would ground in the absence of the Z force. In the absence of the Z force, the R -law-governed forces would act upon the molecular properties of a glass in such a way that these properties would give rise to, and thus ground, the glass's fragility. However, due to the molecular binding which the Z force imposes upon the glass's molecular constituents, the glass is prevented from being rendered fragile. That is, since they are counteracted by the Z force, the R -law-governed forces and the molecular properties of the glass do not give rise to, and thus ground, the fragility of the glass.

To slightly alter the example for the intended purpose, imagine that the Z law is an indeterministic law: the Z law governs the Z force in such a way that there is a probability between 0 and 1 that the Z force will counteract the other fundamental forces acting upon the glass's molecular properties. Thus, it is indeterministic if the glass's molecular properties plus the R -law-governed forces will give rise to, and thus ground, the fragility of the glass at \mathcal{W} . That is, if the fragility of the glass obtains at \mathcal{W} , it will be *indeterministically grounded* by the glass's molecular properties plus the R -law-governed forces. And so, grounding determinism is refuted by the example.

Now, as I suggest, this way altering the example can be applied to *any* example of a grounding relation which is contingent: any case in which a grounded entity Y is contingently grounded by X is a case which can be conceived of in the way just explained. To conceive of some given case as an example of indeterministic grounding, we imagine that the relevant grounding facts obtain at a possible world along with something that plays the role of the Z force: we imagine that X

obtains at a possible world along with some force or phenomenon which has a probability between 0 and 1 of preventing X from grounding Y .

Thus, since it was argued above that composition is a contingent grounding relation, composition can be used as the basis for a conceiving of an indeterministic grounding relation in this way. Take X to be whatever grounds a composite at some possible world W^* : the existence of simples $S_1 \dots S_n$ and the fact that these simples satisfy the conditions for composition at W^* . Take Y to be the composite which these simples would compose if nothing prevented them from doing so. Now, imagine that X obtains at a possible world W^{**} along with some force which has a probability between 0 and 1 of preventing simples $S_1 \dots S_n$ from composing even though these simples satisfy the conditions for composition at W^* . Thus, if it turns out that these simples compose, and thus X grounds Y at W^* , then the grounding relation between X and Y is indeterministic. So, grounding determinism is refuted by the example.

Further, it was discussed above that the grounding relation between the physical and the mental is contingent, as is demonstrated by the possibility of zombies. So, physical-to-mental grounding can be used as the basis for constructing another example of the relevant sort. Take X to be the physical states which ground mental states at some possible worlds and take Y to be mental states. Now, imagine that X obtains at a possible world W^{**} along with some force which has a probability between 0 and 1 of preventing X from giving rise to, and thus grounding, mental states. Thus, if it turns out that X gives rise to mental states, and thus X grounds Y at W^{**} , then the grounding relation between X and Y is indeterministic. So, grounding determinism is refuted by the example.

As I suggest then, the purported difference between causation and grounding regarding indeterminism fails to provide a stable argumentative basis for affirming the distinction between these relations.

4

The Argument from Instability Part 2: Examining the Unintegrated Differences between Causation and Grounding

4.1. The Instability of a Difference Regarding Temporal Profile

To quickly reiterate the purpose of this chapter, this chapter presents the second part of the argument from instability. And this second part of the argument addresses argumentatively *unintegrated* differences between the causation and grounding: differences which are argumentatively independent of one another and thus which require their own independent criticisms.

Returning to the discussion, one might argue that causation is diachronic whereas grounding is synchronic and so, in virtue of this difference in temporal profile, the relations are distinct.¹⁰⁵ Thus we have the “argument from temporal profile”:

Premise 1: Causation is strictly diachronic.

Premise 2: Grounding is strictly synchronic.

Conclusion: Causation and grounding are distinct.

I'll offer several challenges against this argument to show that this alleged difference between causation and grounding is yet another *unstable* foundation for the distinction between the relations. To pose my first challenge, I suggest that the argument fails because it requires a false assumption.

¹⁰⁵ Leuenberger (2013, 156) draws attention to this argument.

The conclusion of the argument follows from premises 1 and 2 only if a specific assumption is true: an assumption I will call the “*temporal constraint assumption*” and abbreviate as “*TCA*.” This assumption runs as follows:

TCA: A relation kind cannot have tokens of two sets such that the relation tokens in one set are diachronic and the relations tokens in the other set are synchronic.

Only if *TCA* is assumed does it follow that a relation token R_1 which is diachronic and a relation token R_2 which is synchronic necessarily belong to distinct relations kinds. The falsity of this assumption is easily illustrated by a considering counterexample. A counterexample to *TCA* is the relation that I’ll simply call “resemblance.” This is the relation by which distinct entities commonly instantiate property tokens of the same kind. Resemblance serves as a counterexample to *TCA* because resemblance holds diachronically in some cases and synchronically in others. To illustrate, imagine two pairs of protons. Imagine that the members of the first pair both exist *at the same point in time* and resemble one another in virtue of both being positively charged. Imagine that the members of the second pair of protons exist *at distinct points in time* and, like the members of the first pair, resemble one another in virtue of both being positively charged.

If *TCA* is accepted, the relation by which the protons of the first pair resemble one another would be distinct from the relation by which the protons of the second pair resemble one another. Generalizing the point, if we accept *TCA* we would be committed to treating any given resemblance relation tokens that are diachronic to belong to a different relation kind than any given resemblance relations tokens that are synchronic. But accepting this seems to be an obvious mistake: resemblance relation tokens are all tokens of the same kind—*resemblance*—despite the differences in diachronicity and synchronicity. This falsifies the *TCA* and thus the argument from temporal fails.

To now offer further criticism of the argument from temporal profile I will argue against premise 1 and thus argue in favor of the claim that causation is or can be synchronic in some cases. I will defend the plausibility of this claim by criticizing the arguments to the contrary. The question concerning whether or not causation is strictly diachronic can be approached via a priori or a posteriori considerations. I will address both approaches.

Firstly, concerning an a priori approach, one might argue that the concept of X causing Y includes X being prior in time to Y , and thus the concept of causation has diachronicity *built into it*. In reply, I think it can be easily illustrated that the concept of causation does not require us to conceive of causal relata as having differing temporal locations. This can be illustrated in two ways. For one thing, there seems to be an *open question argument* that I can pose, as follows. As far as I can tell, the question “can causation be synchronic?” is a perfectly coherent question. The fact that it is coherent is a testament to diachronicity not being built into the concept. If it *were* built in, the answer to the question would be implied by the very meaning of the word “causation” in a similar way that the answer to the question “can a bachelor be a woman?” is implied by the meaning of the word “bachelor.” This does not seem to be the case. So, unlike it being a closed question if a bachelor can be a woman, it does not seem to be a closed question if causal relata can obtain at the same point in time.

To bolster my point, I’ll draw attention to another closed question. Consider a closed question that more closely resembles the question concerning whether or not causation can be synchronic. Consider this question: is the identity relation reflexive? I imagine that it’s not controversial to say this question is closed and that it’s closed quite tightly, as we might say. In whichever way that one might tweak one’s understanding or definition of numerical identity, it would seem the concept of identity would not allow one to treat identity as *irreflexive*. Thus the

concept does not allow for it to be an open question concerning whether or not identity is reflexive. To my mind, the same cannot be said about causation and synchronicity. That is, whether or not causation is synchronic does not seem to be answered by the very meaning of “causation” in the same way the reflexivity of identity is evident in the very meaning of “identity.”

For another thing, causation not being a priori diachronic is evidenced by the following. There have been historical accounts of synchronic casual phenomena that were *not* considered false *in principle*. That is, these accounts were not considered a priori false in virtue of them treating certain phenomena as both causal and synchronic. For example, Newton’s treatment of gravitation as a simultaneous causal phenomenon is an implicit treatment of causation as a relation which is not strictly diachronic.¹⁰⁶ Indeed, Newton’s treatment of gravitation is now considered false but this is not because it is *in principle* false. Newton’s treatment of gravitation is considered false because it wrongly describes the world – not because it was *incoherent* in the respect of treating causation as simultaneous and thus synchronic.

Furthermore, there are various philosophical accounts of causation that do in fact treat causation as *not* being a strictly diachronic phenomenon; such as the accounts of Brand (1980), Huemer and Covitz (2003), and Taylor (1966). Perhaps these accounts are unconvincing for whatever reason, given how they would have us understand causation in general. But if they are considered coherent insofar as they describe causation as not strictly diachronic, this favors my position. If they are considered coherent, this demonstrates that we are not conceptually restrained by the concept of causation such that we must treat causation as strictly diachronic. Thus it would appear to be a questionable claim that causation is a priori diachronic.

¹⁰⁶ Thanks to Ralf Bader (personal communication) for the example.

Now I turn to an empirically minded, a posteriori argument that causation is diachronic. An argument of this sort could be posed as follows. We ought to believe causation is diachronic given that our perceptual observation of causation presents it as something which is extended through time. That is, the diachronicity of causation is revealed through perception of causation. I will offer two replies.

For one thing, this argument seems to be betrayed by its very approach: appeal to the empirical. A leading empirical theory, Quantum Mechanics, seems to offer support for treating causation as synchronic. This is because Quantum Mechanics is commonly considered to deny *locality* and thus to potentially present the idea that what might be considered causal influences are synchronic.¹⁰⁷ However, one might say that this sounds like a somewhat misleading appeal to Quantum Mechanics because there are some local and some non-local Quantum Mechanical theories.¹⁰⁸ If one were indeed to suggest this, I would then re-frame my reply as follows. Appeal to the empirical fails to provide a decisive justification for the claim that causation is diachronic. This is because Quantum Mechanics, a leading empirical theory, has thus far failed to reach a consensus about the issue concerning whether or not quantum phenomena obey locality.

For another thing, appeal to the empirical may appear to *support* rather than disfavor the claim that causation is not strictly diachronic. This is because there are examples of empirical phenomena that may seem to be both causal and synchronic. Some of these examples are as follows. As suggested by Carroll and Markosian (2010), the hypothetical example of a perfectly rigid seesaw might be such an example: "... when one side of the bar moves up or down, the other side moves in

¹⁰⁷ For an overview of the specific issues concerning why non-local influences may or may not be considered causal, see Maudlin (2002, chapter 5).

¹⁰⁸ For an extensive discussion of the differing varieties of local and non-local Quantum Mechanical theories see Berkovitz (2016).

the opposite direction simultaneously,” and thus one side of the seesaw being pushed up or down would synchronically cause the other side to move in the opposite direction (30).

Another potential example is as follows. Consider three poles serving as the legs of a tripod.¹⁰⁹ The tripod standing upright at a given time, being in the position it is in would seem to be caused by the poles at that time each simultaneously resisting the pressure exerted by the other poles. Next consider what Bennett (2011) calls “micro-based determination,” which is the relation between the macroscopic and the microscopic such that the properties of the latter determine the properties of the former. Her example is that of the mass of a table being determined by the mass of its constituent particles. If the particles were to somehow change their mass, there would be absolutely no time lapse between this change and the table obtaining its new mass: the exact moment at which the particles have their new masses would be the very same moment at which the table would have its new mass. So it does not seem like a stretch of plausibility to describe the mass of the table to be simultaneously caused by the mass of its particles.

Next, consider the determinative relation between a neural state and a mental state, assuming non-reductive physicalism just for the sake of illustration. If this relation is considered a causal relation, this example would seem to be a perfectly good candidate for synchronic causation. Lastly, perhaps the most famous example of synchronic causation is that which was suggested by Kant in the first *Critique*. In his own words: “If I look upon a ball that rests on a soft cushion, and makes a depression in it, it [that is, the ball resting on the cushion] is simultaneous with its effects” (1966, 162).¹¹⁰

¹⁰⁹ Thanks to Graham Priest (personal communication) for the example.

¹¹⁰ As Hall (2011) summarizes Kant’s treatment of the example, “the ball-shaped impression on the pillow is simultaneous with the ball sitting on the pillow. Since the two are simultaneous with one another, what makes one the cause and the other the effect? Kant’s answer is that there is a counterfactual asymmetry between the two. Although the

4.2. The Instability of a Difference Regarding Abstract Relata

Various examples of grounding demonstrate that grounding is capable of holding between abstract relata, such as the following. The existence of a set is often thought to be grounded by its members.¹¹¹ A proposition's truth is sometimes thought to be grounded by its truthmaker.¹¹² A number's identity is sometimes thought to be grounded by its location within a mathematical structure.¹¹³ A proposition's meaning is sometimes thought to be grounded by the meanings of the words that compose it.¹¹⁴

In contrast, it's a standard view that causation cannot take abstracta as its relata.¹¹⁵ Hence the purported claim that grounding holds between abstracta, whereas causation cannot, provides an argument in favor of the distinction between these relations. Thus we have the “argument from abstracta”:

Premise 1: Causation cannot / does not hold between abstract relata—causation relates only natural relata.

ball-shaped impression on the pillow follows from the ball lying on it, the ball lying on the pillow does not follow from the ball-shaped impression” (116).

¹¹¹ For instance, see Fine (1994).

¹¹² For instance, see any of the papers in Beebe and Dodd (2005).

¹¹³ For discussion of this, see Horsten (2012, section 4.2).

¹¹⁴ For instance, Szabó (2013).

¹¹⁵ The widespread endorsement of this claim is illustrated by Swoyer (2008)'s comments on the matter. While summarizing the basic, traditional conception of abstracta held by philosophers, Swoyer says: “... the philosophically important features of the paradigm examples of [abstracta]... are pretty clear. They are atemporal, non-spatial and acausal—i.e. they do not exist in time or space (or space-time), they cannot make anything happen, nothing can affect them, and they are incapable of change” (13-14).

Premise 2: Grounding can / does hold between abstract relata—grounding relates can / does relate both natural and abstract relata.

Conclusion: Causation and grounding are distinct.

To challenge this argument, I'll argue against the reasons for accepting premise 1. Firstly, what might motivate one to accept premise 1 is an assumption that I'll call the "domain restriction," which runs as follows:

The domain restriction: Relation kinds are restricted from having tokens within multiple ontological domains (such as the domains of the natural and the abstract).

One basic line of thought by which one might assume the domain restriction is as follows: that which obtains in a given ontological domain is of a distinct nature from that which obtains in a distinct domain. This line of thought might seem perfectly plausible when comparing the nature of the entities within the domain of the natural world with the nature of entities within the domain of the abstract. A difference in the nature of these kinds of entities corresponds to these two kinds of entities obtaining in distinct domains. Thus, one might think the same holds for relations: one might think that the nature of relations which obtain in the natural domain is distinct from the nature of relations that obtain in the domain of abstracta. If one found this convincing then one would indeed have reason to think that relation kinds are restricted from having tokens within multiple ontological domains, which is thus to assume to domain restriction.

Now, if one assumes the domain restriction then one has reason to think that causal determination, which obtains in the natural domain, could not be the same kind of determination that obtains in the domain of abstracta. However, if one's reason for accepting premise 1 is that one assumes the domain restriction, this would be inconsistent with accepting premise 2. Again, premise 2 is the claim that grounding takes relata from *both* the abstract and the natural domain. So to accept

premise 2 is to accept the claim that grounding takes relata from *multiple* ontological domains and this it is thus to accept a counterexample to the domain restriction. So the domain restriction cannot be accepted in conjunction with premise 2.

Further, grounding is not the sole counterexample to the domain restriction. Indeed, there are many. For instance, identity is also a counterexample. All identity relation tokens belong to the same relation kind despite the fact that some of these tokens take natural relata whereas some take abstract relata. If one accepts the domain restriction then one would be committed to treating identity relation tokens that take natural relata to belong to a different relation kind than identity relations tokens that take abstract relata. But accepting this seems obviously a mistake: identity relation tokens are all tokens of the same kind—*identity*—despite the difference in the ontological status of their relata. This falsifies the domain restriction. Further, on the view expressed by premise 2, grounding is itself a counterexample to the domain restriction, for on this view grounding takes relata from multiple ontological domains. So the domain restriction cannot be accepted in conjunction with premise 2 for these two claims are inconsistent.

Various other relations also serve as counterexamples to the domain restriction, such as the following. Some supervenience relations hold between abstracta and some hold between natural relata.¹¹⁶ If one accepts the domain restriction, then one would be committed to treating supervenience relation tokens that take natural relata to belong to a different relation kind than supervenience relations tokens that take abstract relata. But accepting this seems obviously a

¹¹⁶ To provide examples of supervenience relations that hold between abstracta, let's consider the following. Propositions supervene upon their constituent words in the sense that the meaning of a proposition would be different if its constituent words were different. Similarly, conjunctive propositions supervene upon their conjuncts in the sense that the truth value of a conjunction would be different if the truth values of its conjuncts were different.

mistake: supervenience relation tokens are all tokens of the same kind—*supervenience*—despite the difference in the ontological status of their relata.

Another counterexample is resemblance. Many natural entities resemble one another in various ways, of course. Resemblance also holds between abstracta. For instance, some numbers resembles one another in virtue of being prime. Some sets resemble one another in virtue of being well-founded. Some propositions resemble one another in virtue of having the same syntactical structure.¹¹⁷ Thus, premise 1 cannot plausibly rest upon the domain restriction.

A second motivation for accepting premise 1 concerns the view on which abstracta are changeless and eternal, which is not an uncommon view about abstracta.¹¹⁸ To be clear, saying that abstracta are *changeless* is intended to mean that the intrinsic facts about abstracta do not vary across time and thus do not begin to hold or cease to hold at any points in time. Or said more simply, abstracta do not undergo any changes of intrinsic properties. Saying that abstracta are *eternal* is intended to mean that the existence of abstracta does hold *from* any point in time or *until* any point in time: abstracta never come into existence or cease to exist, the *duration* of their existence has no beginning or end.

Now, what does the purported changelessness and eternity of abstracta have to do with premise 1 of the argument from abstracta? To explain this, what needs to be explained first is this: as one might think, the claim that abstracta are changeless and eternal entails the claim that abstracta

¹¹⁷ For example, the proposition “the cat is on the couch” has the same syntactical structure as the proposition “the dog is on the bed.”

¹¹⁸ For instance, Lacewing (2007, 195) explains that it is part of the Platonic view of abstract Forms (that is, the view of Forms attributed to the historical Plato) that Forms are changeless: “In contrast to particular beautiful things, the Form of Beauty is beautiful under all conditions, to all observers, at all times... The Form of Beauty cannot become not beautiful, nor can it have ever been not beautiful... [A]ny change would be a change away from being beautiful. As this is impossible, Forms do not change.” Commenting on the eternity of abstracta, Moreland (2001, 17) declares that the standard conception of abstracta holds that abstracta do not have temporal “duration,” meaning that their existence has neither a beginning nor an end.

are *acausal*. Why does this claim entail that abstracta are acausal? Firstly, an entity being changeless would seem to entail that it could not be subject to causal influence, because an entity being subject to causal influence is for the intrinsic facts about the entity to be subject to *change*. So if an entity is *changeless*, this would seem to be incompatible with it being the subject of causal relations.

Secondly, it may seem that an entity being *eternal* entails that it is not subject to causal influence, because an entity being subject to causal influence could bring about the cessation of the entity's existence. To illustrate, if a physical entity were to somehow be subject to no causal influence whatsoever it is hard to imagine how it could cease to exist. This is because the physical entity being the subject to no causal relations seems to rule out that any influence could affect the entity to cease to exist (or which could contribute to the cessation of its existence). Thus the same may appear to hold for abstracta: if abstracta are eternal and an entity being subject to causal influence is for an entity to be subject influences that could cease its existence (or contribute to the cessation of its existence), then abstracta being eternal entails that abstracta are acausal.

Now, to return to the issue concerning how the view that abstracta are changeless and eternal connects to the argument from abstracta, let's ask: what does abstracta being acausal have to do with premise 1 of the argument? Well, the claim that abstracta are acausal entails premise 1 (which, to reiterate, is the claim that causation cannot take abstracta as its relata): if it's true that abstracta are acausal, then it must be true that causation cannot take abstracta as its relata. Therefore, it may seem that the view that abstracta are changeless and eternal entails premise 1, for this view entails the claim that abstracta are acausal and this claim entails premise 1. So one might be motivated to accept premise 1 of the argument from abstracta because one endorses or is sympathetic to the view that abstracta are changeless and eternal.

Against this motivation for premise 1, I suggest that the view that abstracta are changeless and eternal does *not* entail the claim that abstracta are acausal, and thus this view does not entail premise 1: abstracta being changeless and eternal is consistent with the claim that abstracta can serve as the relata of causal relations.

I suggest that there is a mistake involved in the line of thinking about abstracta on which, as Swoyer (2008, 13) puts it, “[abstracta] cannot make anything happen, nothing can affect them.”¹¹⁹ Abstracta, or at least facts about them, *do* “make things happen” in the sense that facts about abstracta do make other facts obtain. And facts about abstracta *are* affected by other facts in the sense that facts about abstracta are made to obtain by other facts. Further, crucial for the matters at hand, there is no tension between abstracta being changeless and eternal on one hand and abstracta “making things happen” and being “affected” on the other hand. Thus, if this seeming tension is what makes one think that abstracta must be acausal if they are changeless and eternal then their thinking is misguided for this tension is illusory.

I’ll now list examples in order to demonstrate that facts about abstracta can make other facts obtain and thus “make things happen,” and that facts about abstracta can be made to obtain, and thus they can be “affected.” Firstly, let’s consider the fact F_1 that a perfect sphere has the volume that it has. F_1 obtains because of the fact F_2 that the perfect sphere has the surface area that it has. Notice that F_1 obtaining *because of* F_2 does not in any way conflict with the claim that the perfect sphere is changeless and eternal. Secondly, consider the fact F_1^* that the number 2 is the predecessor of a prime number, and consider the fact F_2^* that the number 3 is a prime number. F_1^* obtains

¹¹⁹ To provide more context for Swoyer’s comment, he says (ibid.): “... the philosophically important features of the paradigm examples of [abstracta]... are pretty clear. They are atemporal, non-spatial and acausal—i.e. they do not exist in time or space (or space-time), they cannot make anything happen, nothing can affect them, and they are incapable of change.”

because of F_2^* . Yet, F_1^* obtaining because of F_2^* does not in any way conflict with the numbers involved in the example being changeless and eternal.

Thirdly, consider the set S whose sole member is the empty set ES . The fact that S has a member that is empty obtains because of the fact that ES is empty. So notice that these facts bear an *obtaining-because-of* relation despite that S and ES are changeless and eternal. Lastly, consider the view that each number has its identity because of where it is located in the mathematical structure that is the number line. On this view, the fact that a given number has the identity that it has—or said differently, the fact that a given number’s identity is what it is—is a fact that obtains because of facts about the structure. Again, the example presents us with facts about abstracta that bear an *obtaining-because-of* relation despite that the abstract objects involved here are changeless and eternal.

Thus, it’s not quite right to say that abstracta “make nothing happen,” to continue to use Swoyer’s words. At least, abstracta do make things happen in the sense that facts about abstracta do serve to make other facts obtain, as the examples above demonstrate,¹²⁰ and this is entirely consistent with abstracta being changeless and eternal. In light of all of these considerations, I believe that what might serve to motivate one to resist the claim that abstracta are causal is misguided and thus the argument from abstracta rests on a faulty premise (premise 1).

¹²⁰ Perhaps though one might object to these examples just mentioned for the following reason. In each of these examples above, indeed facts about abstracta make other facts about abstracta obtain, but notice that in these examples the facts on both sides of the *making obtain* relation are facts about *abstracta* rather than natural relata. So perhaps one might then say that this *making obtain* relation between facts about abstracta appears to be *non-causal* because the relations in these examples are confined to the domain of the abstract. If indeed one were to object in this way, I would draw attention to examples in which some facts obtain in virtue of others in which the facts on one side of the relation are about abstracta and the facts on the other side are about *natural* relata. In such examples, the *making obtain* relations are thus not confined to the domain of the abstract. Some examples of this sort are as follows. Firstly, a set whose members are natural relata qualifies as this kind of example given that a set is abstract and given the assumption that a set is grounded by its members. Secondly, a proposition being true in virtue of a truthmaker which is a natural entity (or a fact about some natural entity) also qualifies, given that a proposition and truth are abstracta. In both examples, grounding relations hold between facts within the domain of the natural and the domain of abstracta.

Two objections should be addressed. Firstly, a critic might argue that these examples fail to support the idea that causal relations take abstracta / fact about abstracta as their relata. One could argue that these examples do indeed demonstrate that determination relations hold between facts about abstracta, *but* the examples have a crucial flaw which prevents them from demonstrating that these determination relations are *causal*. The flaw with the examples is this: in each example the facts on *both sides* of the given determination relation are facts about abstracta rather than natural relata. That is, in none of these examples is there a determination relation which relates abstracta/facts about abstracta on one hand and natural entities / facts about natural entities on the other hand. Thus, one might argue that because these relations and their relata are *confined to the domain of the abstract*, therefore, the determination relations in these examples seem to be *non-causal*.

So, the demand that this objection imposes is a demand for examples in which a determination relation crosses the boundary, as we might say metaphorically, between the domains of the abstract and the natural and thus takes relata from both domains. In order to counter this objection, I'll draw attention to such examples and thus satisfy the demand that it imposes. Some examples of this sort are as follows. Firstly, a set whose members are natural entities qualifies as this kind of example: given that a set is abstract and given the assumption that a set is grounded by its members, the fact that there exists a set whose members are natural entities is thus a fact that is made to obtain and thus determined by the fact that those natural entities exist. For instance, the set whose members are the members of the United States congress is a set which exists in virtue of and thus is determined by the existence of those people.

Secondly, truthmaking provides another example of this sort. Consider a proposition *P* whose truthmaker is a natural entity or a fact about some natural entity. The fact that *P* is true is determined by a fact about a natural entity. For instance, the fact that the proposition "Obama

exists” is true is made to obtain in virtue of the fact that Obama exists. In both of these examples, the determination relations cross the boundary between the domain of the natural and the domain of the abstract.

Additionally, one might pose a more general objection to these examples. One might accept even these examples of determination relations that cross the boundary between the domains but nonetheless insist that all of these examples still fail to demonstrate that the *kind* of determination that abstracta bear is *causal determination*. As this objection would go, even accepting the boundary-crossing examples, the entire set of examples demonstrate only that *some* kind of determination takes abstracta as its relata. There is no pressure to think that this relation amounts to causation.

In response, I point out that all that the examples are intended to demonstrate is that *if* the kind of determination relations that abstracta bear are considered causal, this in no way conflicts with the view that abstracta are changeless and eternal. So again, if what motivates one to accept premise 1 of the argument from abstracta is their endorsement of this view, the examples show that this motivation is misguided: the view on which abstracta are changeless and eternal is consistent with the claim that abstracta bear causal determination relations. Thus this view does not entail that it is a *non-causal* kind of determination relation that abstracta bear if they bear determination relations. And so this view fails to justify premise 1 of the argument from abstracta.

To summarize, I have argued that if one endorses premise 1 because one believes that relation kinds cannot take relata from multiple ontological domains (the domain restriction), this endorsement fails because it is refuted by counterexamples. And if one endorses premise 1 because

one holds the view that abstracta are changeless and eternal and one believes that this claim entails premise 1, this endorsement fails because this view does *not* entail premise 1.¹²¹

So, the endorsement of premise 1 stands in need of justification, despite the admittedly intuitive appeal to the idea that causation is strictly a natural phenomenon. What this makes the case for, is that it is worth taking seriously the claim that causation is like identity or supervenience or resemblance, and so on, in the respect that causation is not necessarily confined to the ontological domain of the natural. More broadly, the purported difference between causation and grounding regarding abstract relata fails to provide a stable foundation for upholding the distinction between the relations. Thus, this purported difference does not establish that moderate-GCN holds and GCI does not.

4.3. The Instability of a Difference Regarding Well-Foundedness

4.3.A. The Argument from Well-Foundedness

Call a “grounding chain” a series of entities related by grounding relations.¹²² It is sometimes proposed that grounding chains are necessarily well-founded,¹²³ roughly meaning that grounding chains cannot be limitless: grounding chains must terminate with entities that are ultimately fundamental to all entities in such a chain. I will refer to this view as “metaphysical foundationalism”

¹²¹ I won’t pursue these arguments here but there are other ways by which it could be argued that the relata of causal relations could be non-physical. Firstly, if one accepts that absences or negative facts are causal relata then, because these are non-physical, this justifies the idea that causal relata need not be physical. Secondly, as some would have it, some mathematical proofs offer examples of explanations of mathematical facts that explain *why* a mathematical fact holds rather than merely *that* it holds. If causal explanation is considered a kind of explanation about *why* facts hold, this opens the door to another potential avenue by which to argue that causal relations can obtain between abstracta.

¹²² A simple illustration: say that *A* grounds *B* and *B* grounds *C*. *A*, *B* and *C* thus form a grounding chain. (Note that *A*, *B* and *C* could be either individual entities or pluralities of entities. Thus a grounding chain could be a series of individuals related by grounding relations or a series of pluralities of entities related by grounding relations.)

¹²³ See Schaffer (2010b, 2015).

and abbreviate this title to “foundationalism” (except where noted).¹²⁴ On the assumption that chains of causally related entities can extend infinitely backwards, foundationalism serves as the basis for what I will call the “argument from well-foundedness.” This argument runs as follows:

Premise 1: Causal chains are not necessarily well-founded (chains of entities related by causal relations need not be well-founded).

Premise 2: Grounding chains are necessarily well-founded (chains of entities related by grounding relations must be well-founded). That is, foundationalism is true.

Conclusion: Causation and grounding are distinct.¹²⁵

I challenge this argument by challenging foundationalism, meaning that I challenge premise 2. In order to deny foundationalism, it must be established that the infinite regression of a non-well-founded grounding chain is not a *vicious* regression: such a regression is infinite but *benign*.¹²⁶ So, to argue against foundationalism, I draw attention to a variety of ways in which regresses are sometimes thought to qualify as vicious. And I argue that a non-well-founded grounding chain does not qualify as vicious in any of these ways. Thus I propose that the regression of a non-well-founded grounding chain is infinite but benign, and so, foundationalism can be plausibly denied. More broadly, it can be plausibly denied that grounding is necessarily well-founded whereas causation is not.¹²⁷ Hence, the

¹²⁴ Thus, foundationalism stands in contrast to “metaphysical infinitism;” the view on which grounding chains can be limitless and thus need not have a terminating level containing fundamental entities. Another contrasting view is what is sometimes called “metaphysical coherentism.” On the latter view, entities ground one another in a non-terminating, cyclical pattern, analogous to how the epistemic coherentist would portray justification as a non-terminating, cyclical pattern of dependence between beliefs.

¹²⁵ This argument is explicitly endorsed in Schaffer (2015): “Grounding and causation [bear] a crucial structural difference: grounding needs to be well-founded, causation does not” (36). This is addressed in detail below.

¹²⁶ To address a subtle terminological point, one might use the phrases “regress” or “infinite regress” in an implicitly judgmental way: one might speak of a series as a “regress” to mean that the series is *vicious* rather than benign. I am adopting a neutral use of the phrases “regress” and “infinite regress” and thus will only speak of a series as a vicious series by explicitly calling it “vicious.”

¹²⁷ For further discussion on critical assessment of foundationalism, see Bliss (2013), Cameron (2008), Dixon (2016), Markosian (2005), Morganti (2009), Orilia (2009) or Shaffer (2010b).

purported difference between causation and grounding regarding well-foundedness fails to provide a stable argumentative basis for affirming the distinction between these relations.

4.3.B. Viciousness and Transference

A regressive series consisting in a chain of dependence relations is sometimes considered vicious due to considerations about the infinite transference of some status or property. In such a case, it is thought some status or property is transferred from one node to another in the chain, *ad infinitum*. Historically and in the contemporary era, this line of thinking has been used as a basis for arguing in favor of foundationalism.

To elaborate, this line of thought presents the following picture of dependence chains. For a group of entities that are chained together by dependence relations in the relevant way, the entities at each node possess some property or status X in virtue of having received X through a transfer from the entities that are located at the preceding node in the chain. So on this picture, a chain of dependence of this kind obtains in virtue of a chain of transference between the given entities: because an entity E located at a node N possesses X by virtue of X having been *transferred* to E from an entity E^* at node N_t , therefore, the fact that an entity E possesses X *depends* upon the fact that E^* possesses X . And it is sometimes thought that such a chain must be well-founded for this reason: there must be some node in the chain containing the entities which originally possesses the property or status which is transferred to other entities at successive nodes in the chain. That is, an infinite chain of this sort is *vicious* because there is no first node in the chain from which the transferred property or status originates.

Leibniz (1989) defends an argument for foundationalism works by appeal to the idea that non-well-founded grounding chains are vicious in this specific way. As Leibniz conceives of it, a grounded entity exists or obtains its reality in virtue of what grounds it in the sense that grounded

entities *get* their reality or existence from the entities that ground them. Hence, on this conception, grounding chains involve a transference: that which is transferred from node to node within such a chain is the reality or the existence of the entities in the chain.¹²⁸ And so, a non-well-founded grounding chain on this conception would involve an *infinite* transference of reality or existence throughout the chain. For there is no bottom level in such a chain for the transference to terminate with. Now, since Leibniz considers an infinite transference to be viciously regressive, and since he considers a non-well-founded grounding chain to involve an infinite transference, he concludes that grounding chains must be well-founded. For if they were not, then they would be viciously regressive.¹²⁹ As he concisely expresses this rationale in his correspondence with de Volder, he says that grounding chains must terminate at a node that contains fundamental entities for if such entities did not exist then there would be “... no reality not borrowed. Which is absurd... [W]here there is no reality not borrowed, there will never be any reality, since this must in the end belong to some subject” (Quoted in Adams 1994, 335).

This same argument for foundationalism has recently been defended in contemporary literature by Schaffer (2015):

Grounding must be well-founded because a grounded entity inherits its reality from its grounds, and where there is inheritance there must be a source. One cannot be rich merely by having a limitless sequence of debtors, each borrowing from the one before. There must

¹²⁸ Although it is controversial to treat existence as a property, I will describe the transference of existence from an entity to another entity as a property transference (or as a property *inheritance*). But this terminological choice about speaking of existence as a property is *merely* terminological: it is not intended to reflect the ontological view that existence *is* a property, it is merely a preference for how to articulate claims about existence being transferred or inherited.

¹²⁹ As Leibniz demonstrates his view on the issue, he argues for the existence of mereological simples on the basis that grounding chains must be well-founded: “[B]ecause every being derives its reality only from the reality of those beings of which it is composed, [thus] it will not have any reality at all if each being of which it is composed is itself a being by aggregation [that is, a composite object], a being for which we must still seek further grounds for its reality, grounds which can never be found in this way, if we must always continue to seek for them.” (1989, 85). Thus Leibniz’s rationale is that, as explained above, if grounding chains were non-well-founded, then the transference that is involved in a grounding chain would be infinite. But grounding chains cannot be infinite. For a composite derives its reality from the parts that ground it. So if grounding chains were infinite, then the transference of reality that goes from parts to composite would have no ultimate source. Therefore, there must be mereological simples which serve as the ultimate source of reality from which composites derive their reality.

actually be a source of money somewhere. Likewise something cannot be real merely by having a limitless sequence of ancestors, each claiming reality from its parents. There must actually be a source of reality somewhere. Just as wealth endlessly borrowed is never achieved, so reality endlessly dependent is never realized... (36)

Schaffer (2015) even makes it explicit that he intends this argument to hinge on the idea that non-well-founded grounding chains are viciously regressive because they involve an infinite transference:

I think that a regress counts as vicious if and only if there is an endless chain of dependency with *transference* of the relevant status... It is the 'transfer model' that leads to the need for a *source*. With grounding one is looking at a transference of reality: the grounded entity exists *in virtue* of its grounds. This is why a source of reality is needed, in order for there to be anything to transfer. (36, his emphasis)

What makes the rationale of the argument more precise is attention to the contrast between two kinds of property possession which is assumed by the argument. On one hand, there is a kind of property possession which is *conditional upon inheritance*: a kind of property possession which results from the property having been transferred. On the other hand there's a kind of property possession that is not conditional upon inheritance: a kind of property possession which is thus *independent of transference*. With this contrast in mind, the basic rationale of the argument can be framed as follows. If some entities possess a property *P* by virtue of having inherited it through a transference, then this entails that some entities must possess *P* without having inherited it through a transference. The crucial idea being that a property must be possessed *unconditionally*, i.e. prior to and independently of transference, for any transference to occur in the first place. For a transference can occur only if an unconditionally possessed property serves as the source of that which is transferred.

From this it follows that a chain of reality transference, i.e. a grounding chain, is *necessarily well-founded*: for reality to be transferred within a series of entities—transferred from grounds to grounded that is—reality must be possessed by some entities prior to and independently of

transference. Thus, there must be entities which possess reality unconditionally at a first node in the chain at which the chain of transference terminates.¹³⁰ That is the argument that Leibniz and Schaffer present: grounding chains are chains of transference, and *infinite* chains of transference are necessarily vicious because they require a starting point, that is, a first node containing entities which possess that which is transferred independently of transference. Thus, foundationalism follows.

The crucial premise of the argument is the “starting point premise”: the premise that a chain of transference must have a starting point, and thus a first node containing entities which possess that which is transferred independently of transference. For this premise is what justifies the claim that chains of transference are vicious if they are infinite. But, why should we think that chains of transference must have a starting point? As Bliss (2013) puts it, if one argues in favor of foundationalism by appeal to this premise then this premise “... at best requires independent justification, and at worst begs the question, for... it demands an end point to the chain [of entities in a dependence chain], which is exactly what we are trying to establish an argument for” (407).

To unpack Bliss’ point, let’s ask: why might it be question-begging for the foundationalist to think that chains of transference are vicious if they are infinite based upon the premise that such chains require a starting point and thus a first node? This is question-begging because in order for one to assume that a transference requires a starting point and thus a first node, one must assume a foundationalist view about chains of dependence, for chains of transference *are* chains of dependence. So if one’s basis for thinking that an infinite transference is viciously regressive is the assumption of a foundationalist view about dependence and one argues that because an infinite

¹³⁰ Building on Schaffer’s analogy above with financial transference, the point here is this: just as transferring money from one bank to another requires that some bank account had originally contained money independently of any transference process, the same holds for property possession. That which is transferred must be possessed prior to and independently of transference in order for the transference to occur in the first place.

transference is viciously regressive therefore foundationalism about dependence holds, the argument is clearly circular.

But of course, the foundationalist can avoid this circularity if they can justify the starting point premise on argumentative grounds which do not amount to an assumption of foundationalism. Just as Bliss notes above, the claim that chains of transference require a starting point is a mere assumption unless the foundationalist offers an independent justification for this claim. So what sort of rationale might provide this justification? In his quote above, Schaffer is clear to say why he entertains what I am presenting as the *starting point premise*. He is thus clear about offering a potential way to meet this demand for justification and avoid the argumentative circularity just explained. As he puts it, "... a source of reality is needed, in order for there to be anything to transfer" (36). So, he proposes that without a source of the transferred property, the given property cannot enter into a transference process to begin with.

The problem with Schaffer's suggestion in this quote is that this suggestion serves only to *clarify* the claim in question rather than to *justify* this claim. He makes clear that his conception of transference works in the following way: a process of transference needs an *initial source* in order to be carried out, for without an initial source the process has nothing to serve as the subject of transference. But to claim that a transference requires an initial source is tantamount only to the claim that a transference requires a first stage: the initial stage in which the transferred property is taken from the initial source and thereby transferred to other entities located at posterior nodes in the chain. But this is to re-state in clearer terms the assumption at issue, not to justify the assumption. That is, this claim only serves to point out that Schaffer's conception of transference is a *foundationalist* conception according to which a transference requires a first stage, this claim does

not *justify* his endorsement of the basic foundationalist premise that such chains need to begin somewhere.

To emphasize this point, let's consider the fact that Schaffer is not proposing anything which puts any argumentative pressure on one who adopts an alternative conception of transference. Against Schaffer's foundationalist conception of transference, one might assume an alternative *non-foundationalist* conception. On the latter conception, a process of transference does not begin, the transference goes *all the way down*. The transference infinitely regresses, indeed, but the regress on this conception is benign for this conception simply does not require there to be a starting stage in order for a transference to occur.

Against this non-foundationalist conception, in order to expose the regress as vicious, it would seem that Schaffer would ask: "If there's a property being transferred within the given series of entities then where did the property *come from*? Where did the process of transference *get* the property?" But this question would be pressing *only if we assume that the property needs to have come from a source which is independent of a transference*. That is, the question is pressing only if we assume that a transference cannot occur unless the process of transference "gets" the given property from a source which is independent of transference. But to assume that a transference cannot occur unless it starts by getting the property in this way is to assume the very claim in dispute: it is to assume that transference must have a starting point.

On a non-foundationalist conception of transference, the right response to the question "Where does a given transference process *get* the property that it's transferring?" is this: the question is inappropriate because the question assumes foundationalism due to the way the question is posed. If "*getting*" the property requires that transference has a starting stage at which the property is transferred from an entity which has the property independently of transference, then indeed a chain

of transference does not “*get*” a property on this conception: a chain of transference contains a property for a different reason. That is, the fact that a chain of transference contains the given property is not accounted for in the way assumed by the question “How does a chain of transference *get* the property which is transferred if the transference has no first stage?”

The way to account for the fact that a non-well-founded transference chain contains the transferred property is as follows. The chain contains the property by virtue of each stage of the chain containing the property and each stage contains the property by virtue of it being transferred from a preceding stage. That’s all that is needed to account for how the chain contains what it is that’s transferred between the entities in the chain. Nothing is problematic about this if we do not assume that there needs to be a starting point. If one *does* assume that transference requires a starting point, one is assuming a foundationalist conception of transference which is exactly what this non-foundationalist conception denies.

So although Schaffer’s rationale underlying the starting point premise of the argument in question is a perfectly reasonable rationale, it does not amount to a *justification* of this premise. His specifying that “a source of reality is needed, in order for there to be anything to transfer” is not to provide *reason* to endorse his foundationalist conception of transference on which transference requires a source: this is just to clarify *that* his foundationalist conception requires there to be a source.

As it would seem, using transference as a basis for thinking that non-well-founded grounding chains are viciously regressive is subject to very substantial doubts.

4.3.C. Viciousness and Known Finite Domains

To set up the point to be made in this section, let’s consider how foundationalism about justification—*epistemic* foundationalism—has been defended by appeal to the same basic form of

argument under consideration: an argument to the effect that one must accept a foundationalist view in order to avoid the commitment to a vicious regress.

On epistemic foundationalism, a human being's justified beliefs are ordered by dependence relations such that each belief's justification depends upon other beliefs: the justification of a belief B_1 is thought to depend on the justification another belief B_2 which depends upon the justification of B_3 , and so on. Now, according to what is sometimes called the "regress argument" for epistemic foundationalism, chains of justified human belief could not descend infinitely, therefore they must terminate at some foundational level containing non-inferential beliefs (beliefs whose justification does not depend upon further beliefs).

For purposes of the broader discussion at hand, the important question to ask about the rationale underlying the regress argument is this: why exactly must chains of human justified belief terminate at some foundational level containing non-inferential beliefs? That is, why think that such chains could not be infinite and yet be benign? The reason sometimes provided is this: the domain of human beliefs is a *known finite domain*. That is, because human beings are finite beings, human beings could not entertain infinite beliefs.¹³¹

So, this rationale in favor of epistemic foundationalism suggests that the reason why some infinite chain of dependence is vicious is this: the relevant domain of entities—the domain that the entities belong to which the transference chains serve to connect—is a *finite domain*. This presses

¹³¹ For instance, Fumerton and Ali (2010, section 1) present the regress argument in this specific way under discussion: "If all justification were inferential then for someone S to be justified in believing some proposition P , S must be in a position to legitimately infer it from some other proposition E_1 . But E_1 could justify S in believing P only if S were justified in believing E_1 , and if all justification were inferential the only way for S to do that would be to infer it from some other proposition justifiably believed, E_2 , a proposition which in turn would have to be inferred from some other proposition E_3 which is justifiably believed, and so on, *ad infinitum*. But finite beings cannot complete an infinitely long chain of reasoning, and so if all justification were inferential, no one would be justified in believing anything at all to any extent whatsoever. This most radical of all skepticisms is absurd (it entails that one couldn't even be justified in believing it) and so there must be a kind of justification which is not inferential, i.e., there must be non-inferentially justified beliefs which terminate regresses of justification."

upon us the question: could the metaphysical foundationalist base their view on the same rationale? That is, could the metaphysical foundationalist plausibly hold that the reason than an infinite transference of reality is vicious is that the relevant domain of entities is finite? No. If the foundationalist proposed this, this would be question-begging.

Here is why it would be question-begging. Because metaphysical foundationalism is the view that chains of reality transference must be well-founded, the domain of entities that this view is concerned with is the domain of the entities which possess reality. In different words, the domain of entities that this view is concerned with is the domain of that which exists. Now, to assume that the domain of that which exists is a finite domain one must assume that the chains of dependence relations which order what exists could not be chains that are infinitely descending. But to assume that the chains of dependence which order that which exists are chains which cannot be infinitely descending *is to assume metaphysical foundationalism*. So the *known finite domain* strategy of argument which works the epistemic foundationalist as described above does not work for the metaphysical foundationalist.

So again, grounding chains do not qualify as vicious with respect to this specific sort of viciousness discussed in this sub-section.

4.3.D. Viciousness, Reductive Analysis and Explanatory Failure

As Nolan (2001) notes, infinite regresses are sometimes considered vicious because they lead to the failure of an analysis which is intended to be reductive: "...a theory that is intended to be reductive, and that provides an analysandum which uses the concept to be analyzed" (531). The examples that he uses to illustrate this is the fictional homuncular theory of vision. This theory provides an explanation of vision in which it said that a homunculus which is located "in the head... sees what comes through the eyeballs and communicates this information to the brain" (ibid.) Then a second

homunculus is posited in order to explain the first vision of the first homunculus, and then a third is posited in order to explain the vision of the second homunculus, and so on, ad infinitum. What makes the regress vicious is this: at each stage of the explanatory regress the explanation employs the concept of vision in order to do the explaining, but vision is the very explanandum of the explanation. Thus the regress is vicious because it leads to an explanatory failure which consists of the fact that the explanandum of the given explanation serves as the explananda.

So the question to ask for purposes of the broader discussion at hand is, is an infinitely descending grounding chain vicious in this way? Does an infinite grounding chain lead to this kind of explanatory failure in which case the explanandum serves as the explananda? Bliss (2013) offers a careful analysis of this issue and concludes that the issue does not favor the foundationalist.¹³² As she instructs, whether or not an infinite grounding chain leads to this kind of explanatory failure depends on what the given explanation is supposed to explain. So then let's ask, what exactly is the explanandum supposed to be for an explanation which works by appeal to a grounding chain? The answer is, there are different candidate explananda, such as follows.

Firstly, one might seek to explain why some entities exist by appeal to a grounding chain. This explanandum could be explained by appeal to a grounding chain in this way: the existence of some entities, the *Es*, can be explained by appeal to that which grounds the *Es* and thus what the *Es* exist in virtue of. For instance, the existence of composites can be explained by appeal to their parts: because composites and their parts are linked within a common grounding chain, the grounding chain makes intelligible why the composites exist and thus this explanation works by appeal to the grounding chain.

¹³² All quotations of Bliss in this section are taken from Bliss (2013), and all discussion of Bliss in this section is directed at or expressive of Bliss (2013).

So now we must ask, if the existence of some entities is the explanandum for an explanation which works by appeal to an *infinite* grounding chain, does the grounding chain being infinite result with the explanation failing in the respect in question? Specifically, in this kind of explanation just described, does the explanandum serve as the explanans, just like it does in the example of the homuncular theory of vision? As Bliss points out, the answer is *no* (section 4). Since the grounding chain in question is infinite, the explanation indeed would be infinitely regressive: in such an explanatory regress, some entities at a node in the grounding chain are explained by appeal to the entities which are located at the preceding node, and so on, ad infinitum. *But*, because the explanandum does not serve as the explanans at any stage of the regressive explanation, the regress cannot be considered vicious due to the kind of explanatory failure at issue. In Bliss' words:

If x is grounded in y and y in z, and all that we are seeking for is an explanation of how or why x exists (as the thing that it is), an explanation of how or why y exists, and so on ad infinitum, the regress is benign. Why? Because where z explains y and y explains x our explanans and explanandum are not of the same form... At each stage, we have a satisfactory explanation of that for which we are seeking one. The regress—or perhaps, rather, the series—is benign. (414)

This point is nicely illustrated by an analogy with causal explanation. Imagine an infinitely long causal chain and imagine someone seeks to explain why some event in the chain had occurred. An infinitely long explanation which uses the infinite nodes in the chain as the explanatory sources would *not* fail in the relevant respect: the explanandum would not serve as the explanans in this sort of explanation. Explaining some event which is located within an infinite causal chain in terms of what causes it and to continue this explanatory pattern indefinitely from node to node in an infinite chain is not a case in which the very thing *being* explained serves to *do* the explaining.

Now let's consider a different explanandum for an explanation which works by appeal to an infinite grounding chain. If the intended explanandum was not why some entities exist but was why

anything exists, then this kind of explanation *would* result in the kind of explanatory failure at issue and thus the infinite chain would be vicious. As Bliss explains:

The regress is not benign [for the reason that it leads to the relevant kind of explanatory failure]... if what we are seeking an explanation for is how anything exists, or has being, at all. For even at infinity, what the regress shows is that we have not explained where existence comes from. Even at infinity, we are still invoking things that exist in order to explain how anything exists at all. Or things with being to explain how anything has being at all. We encounter, at each level, the explanatory failure characteristic of a vicious infinite regress: existents whose existence we seek an explanation for are explained in terms of existents. The existence of y may explain the existence of x but the existence of x, y, z and so on ad infinitum cannot help us explain how anything exists at all—where being comes from. (ibid.)

Again, the analogy with causal explanation offers a helpful illustration. Imagine one seeks to explain why *anything is caused*, that is, what is responsible for causation *itself* obtaining. Explaining why anything at all is caused by appeal to an explanans which includes causal facts, even if the causal facts were infinite, would be for the explanandum of the explanation to serve as the explanans. Hence, the explanation would be vicious in the very way at issue.

So, there is indeed a way for an explanation that works by appeal to an infinite grounding chain to be an explanatory failure such that the explanandum serve as the explanans. And thus, there is a respect in which an infinite grounding chain can be considered vicious. *But*, this does not favor foundationalism. For if the foundationalist were to argue that non-well-founded grounding chains lead to this kind of explanatory failure, this would be self-defeating for foundationalism. Here's why. Say that the foundationalist claimed that infinite grounding chains lead to this kind explanatory failure. Therefore, as the thought would go, one must agree that grounding chains are well-founded because fundamental entities are needed in order to successfully explain what cannot be successfully explained by appeal to *non*-well-founded grounding chains. So this implies that the explanandum which fundamental entities are posited to explain is the explanandum which cannot be successfully explained by appeal to an *infinite* grounding chain. Recall that the explanandum which cannot be

successfully explained by appeal to an *infinite* grounding chain is this: why anything exists, that is, why existence itself obtains. So *that* turns out to be the explanandum for which fundamental entities are posited in order to explain: *that* is the explanandum which demands that grounding chains are considered well-founded, according to the foundationalist argument.

The problem is this: if the fact that *anything exists* is the explanandum for which the foundationalist posits fundamental entities to explain, then it turns out that foundationalism cannot explain the intended explanandum. To explain why anything exists by appeal to the existence of fundamental entities is problematic for the same reason it would be problematic to explain why any event causes any other event by appeal to some first causal event. The explanation of why there are any causal facts cannot be explained by appeal to causal facts, likewise for an explanation of why anything exists: the obtaining of existence itself cannot be explained by appeal to the existence of some entities, even if these entities are fundamental to all other entities.

So again, grounding chains do not qualify as vicious with respect to this specific sort of viciousness discussed in this sub-section.

4.3.E. Viciousness, Ontological Extravagance and Parsimony

Yet another suggestion worth addressing that comes from Nolan (2001) is as follows. Nolan (*ibid.*, 534-536) proposes that in some cases an infinite regress might be considered vicious due to considerations about ontological extravagance and ontological parsimony. The idea is that some infinite regresses are or should be considered vicious because if one accepts them, then one is committed to the infinite series of entities that these infinite regresses are associated with, which is ontologically extravagant.¹³³

¹³³ To be clear, not all infinite regresses are such that if one accepts them, one would be committed to an infinite quantity of entities. This is because a regression can be *infinitely regressive* but be associated with a *finite* series of entities. To illustrate, imagine that the justification relation between beliefs B_1 , B_2 and B_3 assumes a circular structure: B_1

In terms of this kind of viciousness, the argument that non-well-founded grounding chains are vicious could be posed very simply as follows. The regress associated with a non-well-founded grounding chain is vicious in the respect that such a chain contains an infinite number of entities, which is ontologically extravagant. So to avoid the commitment to the ontologically extravagant postulation of an infinite number of entities, non-well-founded grounding chains are to be rejected in favor of well-founded grounding chains, which in comparison are ontologically parsimonious because they contain *finite* entities.

I propose that this argument fails because, for various reasons, well-founded grounding chains are not necessarily parsimonious in the way that the argument requires. Firstly, even if grounding chains are well-founded, grounding chains could still be composed of infinite levels which contain infinite entities within these levels. To make this point clear, it should be explicitly reiterated that if grounding chains are well-founded, all that this entails is that grounding chains must terminate with a *bottom* level and thus cannot be composed of infinitely *descending* levels. If grounding chains are well-founded this does *not* entail that grounding chains cannot be infinitely *ascending*; meaning it does not entail that grounding chains cannot be composed of infinite levels which extend *upward* from the chain's bottom level. Since well-founded grounding chains *can* be infinitely ascending, they can contain infinite entities within these infinitely ascending levels. Thus, well-founded grounding chains can fail to be ontologically parsimonious.

is justified by B_2 , B_2 is justified by B_3 and B_3 is justified by B_1 . This series is a finite series. However, there is no point in this chain of justification where the justification reaches a terminating point. This is because for any node in the chain of justification, the justification can be traced to the next node, and so on, ad infinitum. So because the justification is non-terminating and thus this regression runs unendingly throughout the series, the regression is *infinitely* regressive despite that this regression involves a finite series of entities.

¹³³ More carefully said: if one accepts the regress associated with a non-well-founded grounding chain and thus accepts the possibility of a non-well-founded grounding chain, then one is committed to the possibility of there being infinite entities, which is ontologically extravagant.

Secondly, even if the foundationalist were to deny that grounding chains can be infinitely ascending, the claim would still hold that well-founded grounding chains can contain infinite entities and thus be non-parsimonious. This is because even if grounding chains do not infinitely descend *or* infinitely ascend, a grounding chain can have infinite levels *between its terminating lowest level and terminating highest level*. An analogy with mathematics is helpful to make this point. Let's consider the distance on the number line between two numbers, such as the distance between 1 and 50. Indeed, the numerical distance on the number line between 1 and 50 is a distance that terminates with two specific terminating points: the points on the line where 1 is located and where 50 is located. However, there are infinite locations on the number line between these two terminating points where 1 and 50 are located. This is because any numerical distance between numbers can be infinitely divided.

So, now turning attention back to grounding chains, the point that this analogy helps to illustrate is as follows. Just as the numerical distance between numbers is an infinite distance between two terminating points in a series, the same is possible for a grounding chain that terminates with both a bottom level and a top level. Hence a grounding chain which does not infinitely descend or ascend can contain infinite *middle* levels between its bottom and top terminating levels, which means that it can contain infinite entities within those infinite middle levels.

Lastly, even setting aside the idea that grounding chains are infinitely ascending and the idea that a grounding chain might have infinite middle levels, still, there is yet another way in which infinite entities might inhabit a well-founded grounding chain. Assume for argument's sake that the levels of a grounding chain terminate at a bottom level and top level and also assume that the levels between them are finite. This ontological picture is entirely compatible with the possibility of there being infinite entities contained *within a given level* of a grounding chain: nothing about a grounding

chain having finite levels rules out the possibility that the entities at any given level are infinite. Thus the argument at issue fails because it falsely assumes that necessarily, well-founded grounding chains are ontologically parsimonious in the sense that they contain finite entities.¹³⁴

I have thus explored a large variety of ways by which one might think that foundationalism holds because non-well-founded grounding chains are vicious. As far as I can tell, none of the ways work, so there is nothing problematic with holding that grounding chains need not be well-founded, and thus that grounding does not differ from causation with respect to the issue of well-foundedness. So, as I suggest, the purported difference between causation and grounding regarding well-foundedness fails to provide a stable argumentative basis for affirming the distinction between these relations.

4.4. The Instability of a Difference Regarding Fundamentality

One could argue the distinction between causation and grounding is demonstrated by the following difference.¹³⁵ Grounds are fundamental to grounded, whereas causes are not fundamental to effects.

¹³⁴ Perhaps the parsimony-minded metaphysicist would respond as follows. Even if my points in this subsection are convincing, there is still reason to favor well-founded grounding chains: is it only a *possibility* that well-founded grounding chains are not parsimonious whereas non-well-founded chains are *guaranteed* to not be parsimonious. To counter this, it should be reiterated exactly what is under dispute. Foundationalism is the view that it is *impossible* that grounding chains are non-well-founded. This is the view under I am calling into question. If the foundationalist were to argue that the possibility of non-well-founded grounding chains is to be rejected because this possibility fares worse with considerations of parsimony than well-founded grounding chains, then the foundationalist has lost the dispute. For once the foundationalist entertains the idea that the possibility of non-well-founded grounding chains is to be assessed in terms of parsimony, they are not assessing non-well-founded grounding chains in terms of whether modal space could include them. At this point of the dispute, the foundationalist is arguing that non-well-founded ground chains *could* be considered possible but this possibility is unattractive because it is non-parsimonious. So the foundationalist would *not* be arguing that there is reason to think that modal space could not include non-well-founded-grounding chains: the foundationalist is arguing that modal space *could* include them but this should be rejected because it is ontologically extravagant. At this point, the foundationalist has abandoned the dispute about whether non-well-founded grounding chains are genuinely *impossible*.

¹³⁵ deRosset (2013, footnote 4) hints at this argument: “[p]lausibility requires that grounding explanations and causal explanations are not to be identified... [T]he fact that explosions are caused by detonators does not warrant the conclusion that detonators occupy a more fundamental level than explosions.” Thus, deRosset suggests that part of what distinguishes causal explanations and explanations that work by appeal to grounding is the fact that in the case of the

What this hones in on is the idea the difference between the orderings that causation and grounding impose demonstrates that the distinction between the relations. And this presents once again some of the ideas already discussed.

As was discussed above, grounding is thought to impose a fundamentality ordering upon its relata, meaning: if X grounds Y , then X is fundamental to Y . In contrast, causation is thought to impose causal priority: if X causes Y , then X is causally prior to Y . And it is often assumed that what it is for X to be causally prior to Y is *not* the same thing as X being fundamental to Y . If indeed this is assumed, then the orderings which the relations impose would be considered distinct. And from this it follows that the relations are distinct.

Framing this formally:

Premise 1: Causation does not impose fundamentality orderings.

Premise 2: Grounding imposes fundamentality orderings.

Conclusion: Causation and grounding are distinct.

Call this argument the “argument from fundamentality.” The problem with the argument is that the assumption it relies on is one of the most basic claims that *GCI* denies: the assumption just mentioned, such that what it is for X to be causally prior to Y , is *not* the same thing as X being fundamental to Y .

As it was explained in chapter 2 (in discussion of the argument from double-crossers), this assumption is an indispensable part of how grounding is conceived of by those who treat grounding as distinct from causation. For one of the features by which grounding is *individuated*, and thus which

latter kind of explanation, the explanans is more fundamental than the explanandum, whereas this is does not or may not hold for causal explanation.

distinguishes grounding from causation, is grounding's feature of imposing fundamentality orderings. Without this assumption, it's not clear if grounding *can* be individuated, and thus if it can be distinguished from causation. So this assumption is one that is crucial to *GCN* itself, not just the argument from fundamentality.

But notice that this assumption is exactly what *GCI* would lead one to reject if one adopted *GCI*. For if grounding is distinguished from causation by grounding's feature of imposing fundamentality orderings, and one *denies* that there is any distinction between causation and grounding, one would deny that grounding has this feature. As *GCI* suggests, at least as I understand the view, fundamentality orderings and causal orderings are no different, just as grounding and causation are no different. Or to state this point via my preferred way of stating *GCI*: since *GCI* is the view that the distinction between grounding and causation is a *false* distinction, this view implies that the distinction between the orderings which these relations impose is also a false distinction. The orderings which both relations impose, as *GCI* suggests, is just a dependence ordering, nothing more: if *X* grounds or causes *Y*, then *Y* depends upon *X*. Thus, the argument from fundamentality assumes exactly what *GCI* denies. In this respect, the argument is question-begging. For if the argument's crucial assumption is true, *GCI* must be false.

Indeed, this creates something of an argumentative paralysis. In order for the argument from fundamentality to work, it must beg the question against *GCI*. Conversely, in order for me to reject the argument, I must beg the question against *GCN*. This is because, rejecting the relevant assumption which the argument relies on would require that *GCN* is false. So, because I am defending *GCI*, it would seem that I cannot engage with the argument. For if I reject the crucial assumption of the argument, it would seem I must beg the question against *GCN*. And if the

advocate of *GCN* were to use the argument against me, she would have to beg the question against *GCI*.

So, as I suggest, the way to overcome this argumentative paralysis is to disregard this argument and assess the views in question in terms of the other arguments and considerations at hand. And this means that the argument from fundamentality is to be ignored and comparing the views in question is to be carried out by appeal to distinct points of dispute. Thus, the purported difference between causation and grounding regarding fundamentality fails to provide a stable argumentative basis for affirming the distinction between these relations.

5

Conclusion and Implications

5.1. Conclusion of the Dialectic

I propose the following concluding thesis. As chapter 2 demonstrated, there are various points of comparison which deem *GCI* just as plausible, if not more plausible, than moderate-*GCN*. And as chapters 3 and 4 demonstrate, although there are various reasons to think that the distinction holds between causation and grounding, these reasons are paralleled by equally numerous and elaborate considerations to the contrary.

Thus, it should not be assumed that *GCI* is false or implausible. As the discussion has demonstrated, *GCI* can be defended to the same extent that it can be called into question. Further, there are various points of comparison between *GCI* and its rival views which show that *GCI* holds up quite well under an intensive comparative analysis. So as I propose, all of the relevant considerations balance out in such a way that *GCI* is just as serious of a view as its best alternatives: *GCI* is to be taken *just* as seriously as common-genus-*GCN* and subsumption-*GCN*.

5.2. The Myth of Fundamentality

Since *GCI* is the view that the distinction between causation and grounding is *false* distinction, and since the notion of fundamentality is tied to the notion of grounding, *GCI* suggests a broad implication concerning how fundamentality is to be understood.

For *GCI* entails that the kind of ordering imposed by grounding is no different than the kind of ordering imposed by causation. Just as causal priority is priority in a dependence ordering, fundamentality is the same thing and nothing more: *X* being fundamental to *Y* amounts to nothing more than *Y* depending upon *X*, and the *Zs* being fundamental to all else is nothing more than the *Zs* being what all else depends upon. The conception of fundamentality that this undermines is the basic, intuitive conception that if *X* is fundamental to *Y*, then the following holds: not only does *Y* depend on *X*, but *X* has some kind of a *standing in reality* or a *place within nature* that is somehow more *special* than *Y*'s standing in reality or place within nature. This intuition is perhaps felt most strongly when we consider the idea that some entities are fundamental *to all else*: the idea that the *Zs* are fundamental to all else carries with it the intuition that the *Zs* have an utmost-special *place within reality* that amounts to *more* than the fact that the *Zs* are what all else depends upon. Or, to call attention to the relevant intuition via a different sort of illustration, consider the following. Our parents having conceived us is something our existence *depends* upon, for this is what *caused* our existence. However, our intuitions would kick and scream, so to speak, if it were suggested that our parents having conceived us is *fundamental* to our existence. For our intuitions seem to require that what is *fundamental* to our existence is something that has a more special *place within reality* than human beings.

But *GCI*, at least as I envision this view, entails that this intuitive treatment of fundamentality is misguided. For on *GCI*, since causation and grounding are the same thing, and since causal priority amounts to nothing more than priority in a dependence ordering, fundamentality amounts to nothing more than priority in a dependence ordering. In this sense, *GCI* implies that it is a *myth* that there is something about fundamentality which cannot be accounted for

solely in terms of priority in a dependence ordering.¹³⁶ And so, because the discussion above establishes that *GCI* is worth taking seriously, the discussion implies that it is worth taking seriously the idea that *fundamentality is a myth*.

5.3. The Unity of Ontological Structure

As it was mentioned in chapter 1, *GCI* and *GCN* imply different conceptions concerning ontological structure. Since *GCN* holds that causation is distinct from grounding, this view implies the following conception of ontological structure. The kind of ontological structure imposed by causation, or “*built*” from causal relations, is distinct from the kind of ontological structure imposed by grounding, or “*built*” from grounding relations: ontological structure which is *causal* is distinct from ontological structure which is *hierarchal*.

In this sense, if *GCN* is true, then the ontological structure of reality is *disunified*. In contrast, if *GCI* is true, and thus the distinction between causation and grounding is a false distinction, then the distinction between causal structure and hierarchical ontological structure is also a false distinction. So in this way, *GCI* implies that ontological structure is *unified*: ontological structure is built from a single kind of relation and the contents of reality assume one basic kind of ordering. And since the discussion above establishes that *GCI* is to be taken just as seriously as the strongest variety of *GCN* (i.e. moderate-*GCN*), the discussion establishes that the view on which ontological structure is unified is to be taken just as seriously as the view on which ontological structure is disunified.

¹³⁶ Stated more elaborately, if *X* is fundamental to *Y*, *GCI* implies that it is a *myth* that *X* has a more *special* place with nature than *Y* that cannot be accounted for solely in terms of *X* being prior to *Y* in a dependence ordering. Likewise, if the *Zs* are fundamental to all else, *GCI* implies that it is a *myth* that the *Zs* have some utmost a more *special* place with nature that cannot be accounted for solely in terms of the *Zs* being prior to all else in a dependence ordering.

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